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THE ETIOLOGY AND THERAPY OF SPASTIC SPEECH

By MAURICE H. KROUT
Chicago City Junior Colleges

SPEECH PATHOLOGY AND SPASMOPHEMIA. Some psychologists have shown a tendency to deal with speech pathology in rather simple terms. Nineteen years ago Scripture (54) in a well-known publication, designated all lisping and letter-substitution as *stammering* and all other speech defects as *stuttering*. Johnson (36) more recently defined stammering as "a disorder of rhythm in verbal expression, characterized by tonic or clonic spasms, or both, in the neuro-muscular mechanism for the production of sound and speech," thus including stammering and stuttering under a single term.

Efforts at detailed classification of speech disorders have not been wanting. Bridges (13) has offered a classification of thirteen special disorders and many variations. Travis (65) has listed seven major groups and forty-three subdivisions of speech disorders. The American Society for the Study of Disorders of Speech, in 1931, adopted seven major groupings and many sub-groups as its official classification. The major groupings are: 1. dysarthria (defects of articulation due to neural disorders); 2. dyslalia (functional and organic defects of articulation); 3. dyslogia (difficulty in expression of ideas, due to psychoses); 4. dysphasia (impairment of language due to disease, injury, etc.); 6. dysphonia (vocal defects due to defective respiration and disorders of vocal chords); and 7. dysrhythmia (defects of rhythm other than stuttering).

From the official classification of the A. S. S. D. S. it can be readily seen that the field of speech pathology does not belong entirely to the psychologist. The dysarthrias, the dyslalias, the dyslogias, the dysphasias, the dysphonias and the dysrhythmias have been preempted by the physician, since they properly belong in the general field of medicine. For this reason psychological research and practice seem to have been restricted to the *dysphemias* as a special branch of speech pathology. This in itself, of course, is complex enough. Subsumed under the dysphemias are four distinct kinds of speech disorders: 1. agitophemia (agitated speech); 2. aphemia (dumbness); 3. paraphemia (neurotic lisping); and 4. spasmophemia. The latter has been further divided into *dysarthria literalis* (stammering), and *dysarthria syllabaris spasmodica* (stuttering). It is with these divisions of spasmophemia that this paper is concerned.

SOME ESTABLISHED FACTS CONCERNING SPASMOPHEMIA. The ratio of male to female stutterers is 4 to 1, according to the White House conference report of 1930. The frequency distribution for the sexes range from 2:1 to 10:1. Travis (65) has found the percent increasing with the subjects' ages. He has found also that 85% of spasmophemics begin before the age of eight. Another study set the age of early spasmophemics at six.

The White House conference report shows that of 10,000 speech defectives in the general population, about 22% were stutterers. Other reports have been more conservative. Rogers (52) has reported that some 18% of the population suffer from defective speech. According to Dorcus and Shaffer (19), this figure is only 2%. Blanton (6) in a recent publication, asserted that 1% of the nation stutters, and that 5,000,000 Americans have speech defects.

Francis (25) reports that, of over 3,000 children in the public schools of Iowa, 11.5% had speech defects. Of these, 1% were stutterers. In close agreement with this are the findings of McDowell (44) who discovered that stuttering was present in 9% of the population of seven schools having a combined enrollment of 7,000 children. This is similar to the data presented by Travis (65). Stinchfield (62), however, has found that 1.2% of the students at Mt. Holyoke College and the University of Vienna had defective speech, and that the spasmophemias included only 10% of these defectives.

Various other findings have been published. Stinchfield (62) has reported that there is a greater percentage of speech defect among Jewish children than among children belonging to other religious groups. Wallin (68) has shown that speech disorders are more common among colored than among white children. He has also reported a high percentage retardation in school work among children having speech difficulty. Stinchfield's (62) findings agree with his, but indicate that retardation is lowest in the dysphemias. Travis' (65) conclusion is that the stutterer is retarded, on the average, from one to one and one-half school years.

Although Galton (29) had claimed that a greater percentage of stutterers is to be found among geniuses than in the general population, Wallin (68) has recently shown that the highest percentage of speech defect is found among the less intelligent. Travis (65) also found that the feebleminded are more likely to stutter than the normal. This would not mean, of course, that stutterers, as a group, tend to be mentally defective. Francis (25) reported an I. Q. range of 64 to 156, with a mean of 99, for speech defectives. Johnson's (36) group of eighty subjects had a mean I. Q. of 109. In confirmation of Johnson's and Francis' findings, Schroeder and Ackerson (53) reported that stutterers do not differ from non-stutterers in I. Q. Pintner-Paterson tests have shown furthermore that, in non-language intelligence tests, the I. Q. of stutterers is superior to that of normal subjects of 4.4 points. A most careful study along this line was made by Dorcus and Shaffer (19). They compared cumulative I. Q. frequencies of unselected normal and stuttering children, and found these lower for the stutterers. However, Kelly (38) has established that there is a definite relation between reading

and speech disabilities, and that there are definite factors common to both. Hence language tests, such as were used by Dorcus and Shaffer (19), could hardly be said to be diagnostic of speech defectives who are equally deficient in language and speech. Hence their findings do not contradict those obtained on the motor-abilities tests.

Francis (25) compared speech defectives with control groups on the basis of chronological age, mental age, sex, race, and language ability, and found few reliable differences. In an objective study conducted by McDowell (44) it was shown that, in point of intelligence, emotional associations, physical development, etc., stutterers and non-stutterers do not appreciably differ from each other. Using the teachers' rating technique, McDowell found that "differences are very small in comparison with the variability (except in the case of 'self-confidence,' which is markedly in favor of controls), and in 'sensitiveness to approval.' " She further found that "the Kent-Rosanoff test does not reveal any distinctive traits which lie in stuttering children's emotional adaptations." The reaction-times for the experimental and control groups on the "key" words showed no marked differences, at any point in her experiment, as between the two groups. Francis (25) likewise found no differences in teachers' ratings of character and personality of stutterers and non-stutterers.

From the foregoing paragraphs we may get an estimate of the amount of factual material thus far gathered concerning the dysphemias and, particularly, spasmophemia. Other findings obtained through questionnaires are also available, but, since they are less satisfactory as to method (the limitations of the questionnaire techique being generally known), we shall merely summarize from Stinchfield's (62) findings based on the use of this method. She finds that stutterers are as satisfied, sing as often, like to debate as much and as often, and have had speech training in as many instances, as the controls.

Some Debatable Facts Concerning Etiology. Since treatment of speech-defectives depends on the proper tracing of causal factors, it is important that the problem of etiological classification be approached in the greatest possible number of ways. There is a group of psychologists, influenced by the overwhelming evidence showing no difference between stutterers and control groups, who incline toward the belief that there is no special etiology of spasmophemia. The White House Conference report (71) did not find stuttering etiologically related to other speech disorders. Using a combination of the Woodworth-Mathews and Woodworth-Cady schedules for identifying individuals with psychotic tendencies, the Kent-Rosanoff free association test, and a teachers' rating technique based on Terman's inventory prepared for his study of gifted children, McDowell (44) has found that there is evidently no special etiology for spasmophemia. From a group of fifty stutterers, tested for emotional adjustment by the Woodworth-House Mental Hygiene inventory and compared with tabulations of House's normal groups (based on check-mark answers to the inventory and elaborations by a few of the stutterers), Johnson (36) concluded that stuttering is responsible for over 50% of the personality problems of stutterers, and is not significantly responsible for about 30% of such problems. In

their elaborations, subjects reported that their stuttering stood in a causal relation to their shyness, poor appetite, "worrying about sexual matters," remorse, suspicion, feeling of inferiority, desire to steal, and difficulty in adjusting to new places. Thus both McDowell (44) and Johnson (36), in their doctoral theses, concluded that stutterers, as a group, do not show extraordinary social or emotional problems. Johnson (36), however, has found that their "personality problems" do increase with age.

THEORIES OF CAUSATION. The theories of causal influence operating in the dysphemias, proposed over a period of years in various studies, could be classified as follows:

A. Predisposing Factor Theories
   1. Rickets
   2. Locomotor ataxia
   3. Tetany
   4. Epilepsy
   5. Diseased tonsils
   6. Curvature of spine
   7. Nose polyps
   8. Diseased teeth
   9. Intestinal worms
   10. Heredity
   11. Fetal position

B. Structural Theories
   1. Respiratory disorders (imperfect articulation)
   2. Auditory aphasia
   3. Visual aphasia
   4. Associative aphasia
   5. Cerebral circulation (congestion)
   6. Malfunction of striate nuclei
   7. Cerebral dominance
   8. Position of tongue in oral cavity
   9. Handedness
   10. Chemical (metabolic) imbalance

C. Functional Theories
   1. Exhaustion
   2. Prolonged anxiety or stress
   3. Emotional shock
   4. Conditioned inhibition
   5. Anal-erotic fixation
   6. Infantile oral eroticism
   7. Repression of obscenity
   8. Desire for normal social living
   9. Lack of social recognition
   10. Inferiority
   11. "Nagging"
   12. Imitation
   13. Cumulative conditioning.

Various organic disorders and diseases have been causally related to speech difficulties (including spasmophemia). According to Stinchfield (62), rickets and tetany furnish a favorable *soil* for stuttering. The same author holds that hypertrophied tonsils and adenoids, "due to infiltration of toxic substances which affect the nerve centers in the brain and spinal chord" favor the development of habits of stuttering. F. W. Brown (15) also recorded the belief that abnormality in the upper air passages, such as adenoids, enlarged *frenum linguae*, hypertrophied tonsils, etc., serve as predisposing causes of speech disorders. Scripture (54) has made the uncanny observation that stuttering invariably appears after whooping cough, scarlet fever, measles, influenza, intestinal disorders, rickets, etc. Leigh (13) long ago proposed the theory that spasmophemia is caused by the pressure of the tongue against the teeth, instead of the roof of the mouth. Behnke (4) has gone even further, ascribing speech defectiveness to epilepsy, locomotor ataxia, and points of irritation, *viz.*, curvature of the spine, polyps, decayed teeth, and intestinal worms. Reporting specifically on a class of twenty-five girls at Mt. Holyoke College, referred for speech correction, Stinchfield (62) stated that 56% showed the presence of one or more of the following conditions: Malocclusion (poor dentition), hypertrophied tonsils, unfavorable heart condition, deviate septum, low blood-count, thyroid condition, mentrual irregularity, and poor hearing.

Among physiological studies, those of Starr and Stratton (32) are worth noting. Starr, through the study of saliva, and Stratton, through a study of urinary creatine, as special indices of metabolic functioning, concluded that there is a direct relation between metabolism and stammering. So, too, deficiency in the supply of blood calcium and an oversupply of sugar have been deemed to be etiological factors. The fact that many persons with normal speech also have these symptoms largely negates these claims.

Outstanding among early attempts at etiological interpretation are neuro-physiological and psycho-physiological doctrines. Bluemel (8) proposed the theory of transitory auditory amnesia, basing it on the ground that spasmophemia results from cerebral congestion. Swift (63) held that, since visual imagery is transitory, it was visual, not auditory, images that could not be retained by speech defectives. Froschels' (28) theory, based on associative (central) aphasia, placed emphasis on central process, rather than sensory pathology. Robbins (51) is responsible for the hypothesis that stuttering is caused by increased brain volume and pulse, due to fear, shock, and other emotions. He had made a plethysmorgraphic study of the vasomotor responses of a trephined stammerer. Ciampi's (19) theory of the malfunctioning of the striate nuclei, in persistent stuttering, was announced a few years ago. Research on the physiology of vocalization was marshalled in defense of this hypothesis.

Travis (65) and Orton (48) have shown that the lack of dominance by one cerebral hemisphere, or one brain center, leads to a temporary inhibition of impulses, which forces the stutterer to employ both hemispheres, normally possessing relatively equal potential energy. This has been one of the most popular neuro-physiological theories of etiology

in spasmophemia. In keeping with his theory, Travis (65) has reported several hundred cases from his speech clinic at the University of Iowa, of which 43% were originally left-handed. Van Riper (67) confirmed Travis' findings in a study purporting to show that stammerers are more ambilateral than normal controls. This theory, however, was exploded by Fletcher (23) and Wallin (68) who showed that 90.6% of children who were forced to change their handedness habits suffered no ill effects. Parsons (49) found *no* cases of speech difficulty that could be attributed to such a change. Koch (39), in a study of two hundred university students, was also unable to find any relationship between corrected left-handedness and speech difficulties. Fletcher (22) has held that the change from left to right-handedness is not a cause of stuttering. Ojemann (47) found that no single test could differentiate accurately between unimanual handedness and ambidextrous groups. Combining five tests, however, he found handedness to be markedly bimodal. Stinchfield (62) found a higher percentage of right-handedness in groups of stutterers and non-stutterers than did Travis (65) and Jasper (35) in a similar study. She also found fewer indications of ambidexterity among stutterers as compared to normal subjects. Jordan (37) has shown that cerebral dominance is explainable on the basis of a quantitative difference in blood supply. The "lack of dominance" theory (Travis) would seem to imply that the *equalization* of the blood supply in the hemispheres prevents free vocalization. This, according to Jordan, is impossible. Travis' facts, Jordan believes, could be explained on the basis of differences in fetal position .

Several authors have held that heredity is a major factor in spasmophemia. Thus Blanton's (6) theory is that the "hereditary basis for stuttering" is transmitted in the form of a "congenital weakness of the nervous system or of the speech organs themselves." He has departed from the theory of strict organic dependence by holding that a given case may become one of vomiting, of suckling movement, or of stuttering, according to the environmental fixation of the subject. Basically, he has maintained, however, spasmophemia is not traceable to environmental factors: Along with Janet (34), and others, Stinchfield (62) has held to the hypotheses that speech disorders are partly acquired but largely hereditary. The following quotation is from her work on *Speech Disorders*:

"We feel that imagery is a matter of innate endowment. The configuration or conception which a child has of any sensory experience depends on the way the sensory experience is compounded, or upon innate tendencies in the child. Early speech habits of the child are conditioned by the environment. The speed in speech-development depends very much upon encouragement received in that environment—upon social urge, social pressure, and competition for adult attention, as well as upon the physiological stage of development of the child."

Speech is a form of behavior whose origin cannot be found in the pre-natal stage. It is known that "starting with the so-called birth-cry, the child passes to gurgling, cooing, and other indistinct sounds, gradually increasing the range of verbal behavior qualitatively and quantitively until, at the age of 14-24 months, the fundamental patterns of

speech production are established." To say that these are hereditary is not merely to mis-state the issue, but to see why, appearing so early, they may be easily mistaken for hereditary patterns.

"Excessive fatigue or prolonged anxiety or strain in a person of neurotic temperament" has been offered as an etiological explanation of the spasmophemias. Stinchfield (62) in discussing cluttering, says, that a word-salad, so-called, may be caused by "intense emotional strain, anxiety, fear, neurasthenia, or an overwrought nervous state having its origin in unconscious dread and fear, or in extreme tension under which the individual habitually exists." In a series of systematic studies, Solomon (58, 59) defended a similiar point of view. His analysis narrows down to three stages: that of "pure habit," that of "fear of fright," and that of "personality distortion," following in the train of the other stages.

The repression of obscenity, or conflict based on words tabooed in the child's home environment, is Dunlap's (20) older explanation of stuttering. Freud's (27) early theory, too, was that words offering difficulty are related to particular "psychic shocks" and subsequent repressions, and that these words interfere with the flow of conversation. Proceeding on this theory, Coriat (18) has written that stuttering is a device to conceal the stutterer's thoughts from auditors, particularly from the parents, and that infantile oral eroticism is the source of recurrent sucking movements and relevant emotional complications.

Scripture (55) once wrote that the desire of timid personalities to avoid society, and to attain a highly-desirable isolation is gratified through stuttering. Stinchfield (62) has suggested that nagging, scolding, and ridicule by an adult may "set up" the habit of stuttering in the child by possibly facilitating isolation. Blanton (7) has, somewhat similarly, held that stuttering is a symptom of a lack of adjustment to the group, and is caused by fear, partly conscious and partly unconscious, of meeting the group. Stuttering, he stated, "may accentuate emotional attitudes, but it does not cause them." The irritable child's inability to gain attention as easily as do the older children in the family leads him to gain attention by talking faster or louder, or by temper display, with the result that he develops halting, inchoate habits of speech. In a social situation, the individual anticipates his failure, and thus increases his problem. In pursuing this anxiety attack, Adler (....) has suggested, however, that stammerers get certain "benefits" from their apparent difficulty. He held that cluttering is indeed an attempt to withdraw from the superiority of others, based on an "intensified feeling of inferiority." Yet because of it, Adler said, the claim of the stammerer is, "What would I not have accomplished had I not been a stutterer!" This is hardly sufficient to explain the etiology of spasmophemia. It is certain that there is specific inferiority, but Adler did not prove that this inferiority either precedes or follows spasmophemia. He has thus not added to the etiology of the disorder.

A comprehensive theory, advanced by Fletcher (22), has stressed "cumulative conditioning." This theory has outlined the problem as follows:

a. Stuttering originates in the pre-school period, while language is still in the formative period; various emotional tensions may interfere with its development.

b. Stuttering is an *asynergy* of the various steps involved in speech: breathing, vocalizing, articulation, and the accessory movements accompanying the spasm. Thus the subject articulates when he should vocalize, vocalizes when he should articulate, etc.

c. Speech disturbance recurs as a redintegrated response to a cue in social contact.

Fletcher's synthetic approach thus seems to be a sort of capstone to the structural, predispositional, and functional theories surveyed. It stresses early origins. It describes the mechanics of articulation. Finally, it points out that spasmophemia is conditioned by social contacts, and appears to be a response-pattern which is continuously modified in the contacts of the individual.

Even this theory, however, overlooks the fact that so stubborn a characteristic as blocked or hesitant speech must be viewed in relation to the personality as a whole, and in terms of those subtle, non-conscious factors which motivate personalities as they rise from infancy, through the various stages of development, to adolescence and adulthood.

The psychoanalysts have approached the problem from the point of view of a libido striving to realize itself against difficulties. They regard speech defects as forms of articulation resistance which continue because they gratify the libido, "the early pleasure principle." In stammering, as elsewhere, there is a conflict between the ego and the oral libido, between ego-strivings to conceal and the fulfillment of the oral-libidinous desires in the muscle movements of the mouth and tongue.

The writer's own investigations show that, first of all, there must be assumed to be a fixation, or withdrawal, of energy in the field of oral behavior. Oral development is best understood in terms of weaning, the denial of food (or breast), aggression toward the mother due to the frustration, and the punishment that follows aggressive expression such as biting or hyperkinesis. Oral development merges into anal development, not because anal function *follows* oral function, but because anal responses are conditioned, in the enforced control of the sphincter, at a stage in which the oral processes have been well established, and the child has been weaned from the original source of food. Now weaning from indiscriminate bowel-movement, like weaning from breast-feeding, leads to deprivation, aggression by defiant defecation, subsequent punishment, and guilt-feelings growing out of punishment. A repetition of this cycle is found on the genital (or phallic) level of development, when the genital impulses toward the parent of the opposite sex, brother, sister, etc., come into play, and are followed by fear of punishment, repression, and guilt feelings once more.

This theory was not developed by stammerers going through analysis. The Freudian emphasis on developmental stages as a key to basic personality problems is, however, justified in the analysis of speech defectives. Spasmophemia, being an oral defect primarily, must begin with a trauma which had made the mouth the most vulnerable of all possible sensory or motor organs in the organism, thus sensitizing the

individual to difficulties on the oral level. It does not end there, involving subsequently, in the way indicated, the other stages as well.

As obtained in clinical investigations of speech defectives, the developmental formula of speech difficulty could be presented as an implicit type of conversation which the individual carries on with himself, symbolically and in a non-conscious way. Being non-conscious, this conversation need not be expressed in the form of language. It may be directed through other channels, motor or visceral, which individuals find useful for symbolic expression when their responses cannot be translated into words. This conversation, as more or less systematized by the spasmophemic in later years, and as it emerges in clinical analysis, takes this form:

1. I have done wrong
2. I am afraid to speak about it
3. I must not speak about it
4. If I speak, I shall be punished
5. If I am punished, I shall fight (be aggressive)
6. If I fight, I shall be punished even more (be mutilated, be killed)
7. I must keep my peace, and pretend I can not speak *well* (as one stammerer said "My mouth protects my hand.")

The logic of this verbal structure grows out of and comports with the anxiety generated by the conflict between infantile oral impulses and the inhibitions imposed by an adult environment. This logic is possible only on a non-conscious level, since the logic of unconscious behavior is a *different kind of logic*, permitting premises and conclusions of a unique character. It is this sort of logic that keeps deep-seated emotional conflicts unsolved, and makes the recovery of the individual impossible without outside aid. Because these conflicts persist, and the individual continues to be unable to solve them, spasmophemia is characterized by attitudes of anxiety, guilt, and inferiority. Thus it has all the earmarks of a major type of neurosis. Since the origin of the neurosis seems to lie in early fixations, the neurosis must be regarded as a pregenital (oral, especially) development on which certain conflicts of later life become grafted, but which the latter do not cause.

THEORIES OF TREATMENT. Hollingworth (32) has culled from the literature a long list of suggestions for the treatment of stuttering, varying from the "Economizing of breath during speech," to chiropractic treatment. Not to duplicate his effort, we might sum up the various methods of treatment found in the literature in this way:

I. Eclectic Procedures
   1. Animistic
   2. Scientific

II. Surgery
   1. Cutting frenum of tongue
   2. Circumcision

III. Organotherapy
    1. Chiropractic
    2. Vocal mechanics
        a. Respiration
        b. Vocalization
        c. Vowel production
        d. Articulation
        e. Enunciation
        f. Silence — sing-song — metronymics — drawling — internal speech — loud speech
        g. Mirror-talking

IV. Psychotherapy
    1. Relaxation
    2. Adlerian goal-finding
    3. Unconditioning through repetition
    4. Reconditioning through reinforcement
    5. Suggestion
        a. Auto-suggestion
        b. Waking suggestion
        c. Negative suggestion
    6. Hypnosis
    7. Hypnoanalysis
    8. Psychoanalysis
        a. Free association
        b. Dream analysis

One of the early writers (43) recommends abstinence from animal foods (meats), combined with "soul-training and mental gymnastics." An approach such as this can hardly be given serious attention in this survey, and is included merely as an early formulation replaced by scientifically more tenable approaches.

Peripheral irritation, as a cause, has led to the cutting of the frenum of the tongue, and even circumcision (32). These procedures suggest a peculiarly muddled conception of etiological development. Surgical intervention may be indicated in certain types of speech defects (Stinchfield), but to claim that spasmophemia as such is curable by surgery is no more an indication of sufficient understanding than is "soul-training and mental gymnastics."

Fletcher's (22) treatment follows a scheme based on an eclectic etiology. This scheme includes a large variety of mechanical aids to enunciation, *e.g.*

1. Relaxation
2. Habit formation
3. Spontaneity
4. Increasing embarrassment
5. Equilibration
6. Melody and flexibility
7. Correct breathing
8. Developing slowness

9. Correct thinking
10. Belief in success
11. Subsconscious readjustment

In spite of this elaborate program, Fletcher considers suggestion an all-important part of the cure. Considering spasmophemia essentially a product of social situations, he believes that, in the last analysis, it can be modified by a change of social relations between the subject and experimenter. Thus he supplements mechanical procedures with social suggestion.

Scripture (55) holds that, "since hyperphonia is the result of a compulsive idea, it is necessary to "get the mind off the idea" during speech, *i.e.*, to proceed by waking positive suggestion. Dunlap (20), on the other hand, uses negative suggestion as a treatment method. Dunlap shows that modified repetition may be used to break or to establish habits. "The way to do away with a bad habit is to repeat it." Repetition in itself has no effect, however. Asking the stutterer to stutter, the enuretic to wet himsel, the nail-biter to bite his nails, etc., reaches a point where *voluntary* repetition (auto-suggestion?) tends to remove the symptom. Dunlap's method is in direct opposition to the method of Fletcher and others who have the stutterer speak more slowly, and stop the subject as soon as he begins to stutter, presumably to avoid suggestion. Essentially Dunlap's procedure is one of weakening a conditioned response by frequent repetition without reinforcement by the original stimulus.

In a recent work, Bluemel (11) also stresses the method of conditioning. Assuming that spasmophemia is a matter of conditioned inhibition, he proposed to dis-inhibit the conditioning or uncondition the inhibition. He does so by reenforcing the exercises provided for his subject, thus reconditioning him also. When the subject falters, Bluemel at once joins him in reading to prevent the inhibition from operating. "Conditioning," says Bluemel, "is not so much a matter of teaching as a matter of receiving opportunity to respond *positively* to appropriate stimuli." However, Bluemel admits that the methods he uses apply exclusively to so-called "primary stammering" cases. In "secondary stammering," where diffuse and elaborate conditioning is involved, and where the symptoms are far removed from the original traumatic influence, the results are admittedly negligible. The same, of course, holds true of Dunlap's approach, since both unconditioning and reconditioning operate most successfully in cases of nascent trauma in which the stimulation dealt with can be easily traced, and the response reorganized on a more desirable basis.

The hypnotic technique involves the use of suggestion in its purest form. The object of hypnosis is to trace the symptoms to their point of origin, and use suggestion as indicated. This method has been very widely employed. Bramwell (12) reports that one of his patients, after two years' hypnotic treatment, was practically well. In another case, the report was "stammering improved," and apparent success noted. Forel and others (12) were disappointed in their results. Wetterstrand (12), using hypnosis, reports 15 cures in 45 cases, 13 of those cured

being children between the ages of 5 and 12 years. Of those that were not cured, Wetterstrand reported 19 as improved and 14 unchanged. Ringier (50), Von Coral, Hamilton, Osgood and others (12), have also reported some successful cases. A number of psychologists *viz.* Taylor (64), McDowell (44), Morgan (46), Krout (41) and others, have employed the technique of hypnoanalysis. This technique differs from hypnotic suggestion in that the former aims to discover some unrecognized trauma to which the subject's behavior difficulties could be traced from the specific words at which blockage occurs. The findings achieved by hypnotic or hypnoanalytic techniques, involving the manipulation of unconscious, repressed material, are not exceedingly favorable. These techniques must be said to effect only proximate changes of behavior, leaving recovered material essentially unassimilated. Thus the difficulty remains always in danger of recurrence.

The Adlerian approach, as is well known, consists in discovering life-goals. No activity is regarded by Adler as intelligible, unless the goal sought has been clearly established. Spasmophemia, from Adler's point of view, is merely a postponement-phenomenon, traceable to the subject's decision to avoid defeat. Adler thus urged that goal-lines be worked out to discover why the individual fears defeat, and why he would rather lose than win. As actually applied, the Adlerian technique presupposes the existence of considerable intelligence, and commonly ends in deliberate suggestion procedures of one sort or another. It can thus be regarded as little other than palliative in its effects.

The psychoanalytic approach, using free association and dream analysis as treatment techniques, has been described by Freud and his disciples—Coriat (17, 18), Stekel (61), Fenichel (21), and others. Coriat (18), in an earlier day, recommended analysis of the "neurotic panic" to discover specific fear situations which may underlie a given case of spasmophemia. Fenichel recently wrote: "It is a remarkable fact that the stutterer does not appear to cling to his chief symptom to the same extent as other neurotics do. Hence, the stuttering itself may frequently be eliminated without influencing the pregenital elements which are responsible for the predisposition to develop stuttering (21)." Krout (41) has reported success in the use of passive analytic therapy with speech defectives, and established the superiority of this method over others in several cases. Those using passive methods decry especially the use of speech training in its mechanical or conditioning aspects. Such training, they find, only reinforces oral-erotic pleasure fixations. It is basically wrong not only because it "stamps in" the difficulty, but because it is directed at the symptoms rather than the causes of the speech neurosis.

In refutation of this point of view, Blanton (6) pointed out that Freud had told him personally that he (Freud) "felt sure that there were constitutional factors in stuttering, and that except in rare cases, psychoanalysis alone was not able to effect a cure." The same attitude is reported by Blanton to have been expressed by such noted analysts as Anna Freud and A. A. Brill. Scripture (54) likewise has said that one may "get at the root of the fear by psychoanalysis, but this alone is not adequate, and no stutterer has ever been cured by it." Bluemel

(11) has stated that the effect of psychoanalytic therapy, in most cases, has been negative.

It is difficult in the present state of psychotherapy to say with confidence what method, or combination of techniques, will serve the needs of the speech patient best. A few things, however, seem to be patent at this time. In the first place, no illness or disorder, whether functional or organic, whether structural or behavioral, can be treated with absolute certainty of success. This is true of appendicitis, pneumonia, and syphilis no less than it is of phobic, overcompensated, or regressive types of adjustment . In the second place, no disorder or disease could be succesfully treated unless its etiology has been thoroughly traced and experimentally established. In the third place, it must be stressed that every illness or disorder involves the organism as a whole, and must be treated from this point of view in every case. Finally, the prediction of therapeutic success is always proportional to the length of the period of development, chronic cases being always the most difficult to relieve.

It is thus futile to claim that any method has proved uniformly successful in the treatment of spasmophemia. The treatment of speech disorders is no exception to the rule governing all disorders. Partial success in the use of various methods, and the limited number of cases reporting recovery, seem to suggest that the etiology of spasmophemia has not been completely established. The analytic contributions are undoubtedly the most relevant and the most substantial, but analysts have generally sidestepped the etiology of spasmophemia as such, stressing the general structure of neurosis. However, since those employing passive analysis have not reported success in the majority of the cases treated, they have been led to assume the existence of a variable in spasmophemia which is occasionally present and occasionally absent. This variable may derive from the special development of certain cases, but is more likely to be found in the interpersonal relations of operator and subject. The final inference, at any rate, is that both etiology and therapy of spastic speech are in need of further research at this time.

The fact that all therapy involves the organism as a whole implies that the treatment of speech defects must give way to the treatment of speech defectives. This means helping the speech patient, first of all, to reconstruct the genesis of his neurosis in every case. It means helping him to recover his basic repressions *in situ*, reveal his conflicts, and formulate for himself the steps through which his difficulty has passed. Unless the patient acquires self-confidence, by reconstructing his personality on a higher level, he cannot achieve freedom from blockage in his speech behavior. Finally, it appears unquestionably established that the greatest successes of speech therapists have been achieved with the young, rather than with adults. This means education of parents and teachers to the end that they arrange for early therapy. Brought to the speech clinic as soon as his difficulty has been ascertained, any speech patient can be promised more success than he could possibly expect in later years.

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STUDIES IN THE PSYCHOLOGY OF STUTTERING

XVII. A STUDY OF THE TRANSFER OF THE ADAPTATION EFFECT IN STUTTERING[1]

WILLIAM E. HARRIS

I. INTRODUCTION

This study was designed to answer the question: "Does reduction in stuttering frequency with repeated readings of the same passage affect stuttering frequency in other speech situations?" It has been found that stuttering frequency usually decreases with successive readings of a passage (1, 2, 3, 4, 5, 6), but no data bearing directly upon the specific problem of the present study have been reported.

Johnson and Knott (1) found that frequency of stuttering decreased significantly in successive repetitions of the same material. The passage used in their study was read ten times in succession by each of fourteen subjects, the difference in per cent of stuttered words between the first and tenth reading being 9.5 larger than its standard error. Johnson and Solomon (2) found that in four readings of the same passage, stuttering frequency was reduced each time, even though a period of from one to seven days transpired between the second and third readings. Johnson and Millsapps (3) reported that frequency of stuttering decreased in successive readings of identical material. Johnson and Inness (4) reported a total adaptation of 48 per cent (i.e., 48 per cent fewer stuttered words) between readings one and five of a given passage, for 41 stutterers, thus indicating that only five readings are necessary to get a significant adaptation effect. They also found that greater adaptation occurred when the word content remained constant than when the subjects read five different passages in immediate succession. Maddox (5) reported that frequency of stuttering significantly increased after having first decreased during successive readings of the same passage, when the stutterer observed himself in a mirror while reading orally, but that following the increase in stuttering frequency with introduction of the mirror, the stuttering frequency again decreased in the courses of five successive readings of the same passage. Van Riper and Hull (6) have also shown that with reading material remaining the same, less and less stuttering occurs with successive readings.

II. PROBLEM

The purpose of this experiment was to determine if reduction in stuttering frequency with repeated readings of the same passage is associated with reduction in stuttering frequency (1) in the oral reading of a similar passage and (2) in a conversational situation.

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[1]This study was directed by Dr. Wendell Johnson at the University of Iowa as part of a program of research in stuttering.

III. PROCEDURE AND SUBJECTS

Subjects

Twenty stutterers, 19 male and one female, served as subjects for this experiment. Eleven of the subjects were secured from the University of Iowa, four from the Davenport, Iowa, public schools, and five from the Des Moines, Iowa, public schools. Ages for the group are listed in Table I.

TABLE I

AGES IN YEARS OF THE 20 STUTTERERS USED IN THIS STUDY

Age	No.	Age	No.
11	2	19	1
13	2	20	2
14	1	21	2
15	1	22	2
17	4	24	2
		26	1

The group consisted chiefly of adult or young adult stutterers, only six being below the age of 17 years. All of the subjects were taking remedial speech training at the time the experiment was performed.

Observational Reliability

The observational reliability of the experimenter was determined, in advance of collecting the data, in the following two ways:

1. A phonograph record of stuttering speech was played on each of four different days, and stuttered words were marked on mimeographed copies of the material. The average per cent of agreement from day to day in terms of the number of stuttered words marked was computed in the following manner:

Counts were made of the number of words marked on each of the four days; of the total number of different words marked during the course of the four days; and of the number of words marked on all four days, on three days only, on two days only and on one day only. The agreement on particular words marked was computed by the formula $\frac{x}{y}$ = per cent of agreement, in which y represents the maximum possible number of agreements and x represents the number of obtained agreements. The maximum possible number of agreements was determined simply by multiplying the total number of different words marked during the course of the four days by six. The number six was used here because maximum possible agreement would involve the marking of every word marked at all on each of the four days. The experimenter, by marking a given word as stuttered on each of four days, would agree with himself six times, since the number of times that four things or events can be combined, taking them two at a time, is six, the formula being $.5n\,(n\text{-}1)$. Where n equals four, the above formula gives the value six. The number of obtained agreements was found by computing the number of times the experimenter agreed with himself in marking each of the words marked at all, and by summing the values thus obtained. For a word marked as stuttered on one day

only, the experimenter would show no agreements with himself; for a word marked as stuttered on two days only, he would obviously agree with himself once; for a word marked on three days only, he would agree with himself three times; and as indicated above, he would show six agreements with himself in marking a word on every one of the four days. Therefore the formula yields a measure which may be represented as the per cent of the maximum possible agreement shown by the observer.

The recording played on the four days consisted of the speech of four individual stutterers, each of whom read a standard 180-word passage, *Arthur, the Young Rat.* The per cents of maximum possible agreement on stuttered words, as computed by the above formula were as follows: Stutterer No. 1, .92; Stutterer No. 2, .95; Stutterer No. 3, .94; and Stutterer No. 4, .65; the average per cent of agreement was .86. The low per cent of agreement on the speech of Stutterer No. 4 was probably due to his extremely unusual pattern of blocking, *i.e.*, a rapid repetition of initial sounds, accompanied by a general jerkiness in phonation, during his apparently unstuttered speech, thus making it difficult to distinguish "blocks" from "jerks."

2. Next, the experimenter and another speech clinician listened to the speech of four different stutterers for a period of five minutes on each of four days and independently marked the stuttered words by means of a signal key and polygraph set-up. After the reading was finished, the polygraph tape was checked and the stutterings on which the experimenter and observer agreed were counted. The agreement between the experimenter and observer was counted for each day by using the formula $r = \frac{c}{\sqrt{xy}}$ in which c represents the number of words marked by each of the two observers, respectively.[2]

The degree of agreement between the experimenter and the second observer was as follows: 1st day, .92; 2nd day, .93; 3rd day, .91; and 4th day, .92, the mean degree of agreement for the four days being .92.

Experimental Procedure

The experimental procedure was as follows. All reading and speaking by each of the 20 subjects was done at one sitting. First, a 180-word control passage, *The Rainbow*[3], was presented to the stutterer with the direction, "Simply read this passage through twice at your normal rate of reading." Stuttered words were marked by the experimenter on mimeographed copies of the passage. After the passage had been read twice by the stutterer, he was handed a jig-saw puzzle with the direction, "Here is a jig-saw puzzle. Try to complete as much of it as possible in half-an-hour, but there will be no penalty if you do not finish." After a half-hour period, the stutterer was told to stop his work with the puzzle, and to read the *Rainbow* passage twice more. The experi-

[2]This formula is equivalent to the one presented on page 364 of *Psychometric Methods*, by J. P. Guilford.

[3]See Appendix No. II in the manuscript copy of this report on file in the University of Iowa Library.

menter marked stuttered words on mimeographed copies of the passage as before.

Next, the stutterer was told to read a 180-word passage, *The United States*,[4] twice. In order that the stutterer be used in the experiment, he must have stuttered on at least 5 per cent of the words in the two readings combined (18 words), or on 10 per cent of the words in the first reading. If the stutterer failed to stutter the above mentioned number of times, he was not used in the experiment. This procedure was felt to be necessary in order that a sufficient number of stutterings occur in the first readings to afford an adequate basis for comparison with later readings.

After the stutterer had been selected for further testing on the basis of the above mentioned criteria, he was told to read another 180-word passage, *The Grandfather*,[5] twice. Stuttered words were marked on mimeographed copies of the passage by the experimenter.

Next, a four-minute phonograph recording was made of the stutterer's conversational speech. (Six of the recordings were made by the sound technician in the Department of Psychology at the State University of Iowa and the remaining fourteen were made with a portable recorder by the experimenter.) In order that the conversations recorded might be compared with each other, a list of 20 items was used to serve as the basis of each stutterer's "conversation." The directions given the stutterer were as follows:

"Following is a list of objects about which you should talk in order that a record may be obtained of your conversational speech. Let the object be simply a starting point for you in speaking. For example, an almost empty ink bottle is one of the articles which you will talk about. You could say: 'This is an empty ink bottle. The brand is Script ink which I find to be very good (or bad). It doesn't clog in my pen like some of the other inks do. I prefer black ink to blue ink, however. A bottle of ink usually lasts me for several months . . . ' and so on. Say anything you happen to think of. Use your own ideas about any of the articles presented and do not hesitate to state them. Talk about each article as it appears in the list.

"Take your time, but do not let there be too long a pause in your conversation between two successive articles, as the recording machine will be running continually and this would waste a good part of the record. And don't attempt to rush so that you can talk about all the articles—if you only talk about the first five, the purpose of the recording will have been served. And finally, say what you want to say. That is, don't substitute words for any you may find difficult to say. Do you understand?"[6]

After completing the first recording, the stutterer was given a five-minute rest period. Following this, the *United States* passage was again presented to the stutterer, who was told to read it and keep repeating

[4]See Appendix No. I in the manuscript of this report on file in the University of Iowa Library.

[5]See Appendix No. II, *op cit.*

[6]See Appendix No. III, *op. cit.*, for list of articles for the first conversational period and the list for the second period.

it until he was told to stop. The stutterer was told to stop as soon as he had read the passage fifteen times (including the two preliminary readings), or he was stopped short of this maximum number of readings provided he gave three consecutive readings of the passage with two, one, or no stutterings in each reading. All stuttered words were marked by the experimenter on mimeographed copies of the passage.

Next, the stutterer was again given a copy of the *Grandfather* passage, and was told to read it twice, the experimenter marking each word stuttered on mimeographed copies of the passage.

Finally, a second four-minute phonograph recording was made of the conversational speech of the stutterer. Directions given for the second reading were the same as those for the first. An entirely different list of articles was presented for this second recording.

IV. RESULTS

The per cent of stuttered words was computed for each reading and recording made during the experiment.[7] In order to facilitate comparisons and to present the data in condensed form for interpretation, Table II was prepared. In this table the first and second readings of the *Rainbow* control passage are combined, as are the third and fourth readings, and the per cent of stuttered words for each of these two combinations is given. Likewise, the first and second readings of the *United States* passage were combined, as were the last two readings of the same passage, the per cent of stuttered words for each of the two combinations being presented in the designated columns. Finally, the first and second, and the third and fourth readings, respectively, of the *Grandfather* passage were combined, the per cent of stuttered words in each combination being presented in a similar manner. The per cents of words stuttered in the first and second recordings are also presented.

In order to determine whether passage of time (one-half hour) between two readings of the same passage was followed by a reduction or increase in words stuttered, the following procedure was employed. The per cent of stuttered words in the third and fourth readings of the *Rainbow* passage were subtracted from the corresponding per cent in the first and second readings for each stutterer, and the differences were added algebraically. The mean difference between the first two and the last two readings was found to be 1.8 with a S. D. of 3.0. The standard error of the mean[8] was found to be .68, the critical ratio between the mean difference and the standard error of the mean being 2.6. Thus it can be seen that while there is a difference between the two pairs of readings, this difference is not definitely statistically significant. Regardless of its statistical significance or lack of it, however, this may be regarded as a base or control amount of adaptation for purposes of this study, and the amounts of adaptation obtained in the other read-

[7]See Table II in the manuscript copy of this report on file in the University of Iowa Library.

[8]Since this sample included less than 25 subjects, N-1 was substituted in the formula for deriving the S. E. of the mean. See p. 113, *A First Course in Statistics*, by E. F. Lindquist.

ings and in the recordings of conversational speech may be compared with it.

Next, the per cent of stuttering in the paired last two readings was subtracted from the per cent of stuttering in the paired first two readings of the *United States* passage for each stutterer, and these differences were added algebraically. The mean difference between the first two and the last two readings (in per cent of words stuttered) was found to be 12.7, with a S. D. of 9.5. The standard error of the mean was found to be 2.1, the critical ratio between the mean difference and the standard error of the mean being 6.04. This difference represents, therefore, a statistically significant amount of adaptation with successive readings of the same passage in this experiment. This is important, because significant adaptation had to be produced if its transfer were to be investigated.

Likewise, the per cents of stuttered words in the last two readings of the *Grandfather* passage were subtracted from the per cents of stuttered words in the first two readings of the same passage. Here the mean difference was found to be 3.7 with a S. D. of 3.5, and the standard error of the mean was found to be 0.8. The critical ratio between the mean difference and the standard error of the mean was found to be 4.6, thus indicating that the difference is statistically significant.

The mean difference in per cent of stuttered words between the last recording and the first recording was not found to be statistically significant. Here, as above, the per cents of stuttering in the last recording were subtracted from the per cents of stuttering in the first recording, and these differences were added algebraically. The mean difference was found to be 1.2, with a S. D. of 7.6, and the standard error of the mean was found to be 1.7. The critical ratio between the mean difference and the standard error of the mean was found to be 0.70.

In Table III, findings are presented which indicate that more adaptation (i.e., reduction in frequency of stuttering) is involved in the successive repetitions of the same passage (the *United States*) than in (a) two pairs of readings of a passage (the *Rainbow*) spaced one-half hour apart, with no intervening reading; in (b) two pairs of readings of a passage (the *Grandfather*) separated by the several successive readings of the *United States* passage; and in (c) two recordings of conversational speech also separated by several readings of the *United States* passage. The statistically signifiant C. R.'s, 5.4, 6.9, and 4.7, given in Table III, are the basis for this statement. These are critical ratios of differences between mean differences. For example, the mean difference in per cent of stuttered words between the first two readings and the last two readings of the *United States* passage was 12.7; the mean difference in per cent of stuttered words between the first two and the last two readings of the *Rainbow* passage was 1.8. As shown in Table III, 5.4 is the critical ratio of the difference between these two mean differences, and it indicates that significantly more adaptation was involved in the readings of the *United States* passage than in the readings of the *Rainbow* control passage. The other C. R.'s in Table III are to be interpreted in like fashion as C. R.'s of differences between mean differences.

TABLE II

PER CENT OF WORDS STUTTERED BY EACH STUTTERER IN FIRST AND LAST PAIRS OF READINGS AND IN FIRST AND SECOND RECORDINGS OF "CONVERSATIONAL" SPEECH.

Subject No.	*Rainbow* passage reading No.		*United States* passage reading No.		*Grandfather* reading No.		Recordings	
	1, 2	*3, 4*	*1, 2*	*last two*	*1, 2*	*3, 4*	*No. 1*	*No. 2*
1	28.0	30.5	33.8	1.1	13.3	1.9	22.3	17.6
2	16.9	16.3	18.3	16.3	10.2	8.3	13.8	13.7
3	3.3	3.3	10.8	0.0	0.8	0.2	9.9	8.0
4	18.3	11.9	10.2	1.1	6.6	6.6	20.9	18.9
5	15.8	19.4	21.3	0.5	8.3	0.8	2.6	3.2
6	13.0	5.5	88.0	1.1	4.7	1.1	7.4	7.6
7	5.0	0.5	77.5	0.2	1.6	1.1	5.0	3.4
8	11.3	8.8	10.0	7.2	8.6	5.8	20.9	16.8
9	30.2	26.1	30.5	1.1	12.7	5.5	15.4	23.8
10	25.5	15.0	31.3	0.8	12.7	0.2	8.4	12.1
11	3.0	0.2	6.3	0.2	1.3	0.8	13.6	28.9
12	6.3	4.1	9.7	0.5	3.8	0.8	6.0	6.0
13	5.5	4.7	10.0	0.8	1.9	1.1	21.5	13.5
14	11.6	8.0	13.3	0.8	1.6	0.5	32.1	35.2
15	25.8	20.5	16.9	2.5	7.2	0.8	32.8	34.6
16	46.6	44.7	26.9	0.5	10.0	1.1	50.5	20.6
17	10.6	14.1	15.8	0.4	9.7	7.2	16.1	15.4
18	16.6	16.1	22.5	18.0	17.5	18.3	20.9	16.8
19	29.7	34.1	36.1	33.8	26.9	20.8	32.1	32.2
20	7.7	9.4	13.3	7.2	7.2	6.3	9.0	8.7
Mean Diff.		1.8		12.7		3.7		1.2
S. D.		3.0		9.5		3.5		7.6
S. E.		0.68		2.1		0.8		1.7
Mean/S. E.		2.6		6.04		4.6		.70

TABLE III

CRITICAL RATIOS OF THE DIFFERENCES BETWEEN THE MEAN DIFFERENCES (BETWEEN PER CENTS OF STUTTERED WORDS IN THE FIRST AND LAST PAIRS OF READINGS, AND IN THE FIRST AND LAST RECORDINGS OF CONVERSATIONAL SPEECH), AND CORRELATIONS BETWEEN THE DIFFERENCES.

	C. R.[9]	Correlation
Rainbow vs. *United States*	5.4	.22
Rainbow vs. *Grandfather*	2.1	.16
Rainbow vs. recordings	0.3	−.21
United States vs. *Grandfather*	6.9	.98
Grandfather vs. recordings	1.4	.21
United States vs. recordings	4.7	.18

The C. R.'s of 6.9 and 4.7 shown in Table III indciate that aside from the question as to whether there was any transfer of the adaptation effect occasioned by the successive readings of the *United States* passage, to the last readings of the *Grandfather* passage and to the "conversational" speech, there was more adaptation involved in the *United States* readings than in the *Grandfather* readings or in the speech recordings.

The question of the transfer of the adaptation effect may be approached, first, by considering the other C. R.'s in Table III. The C. R. of 2.1 indicates that some, but limited, significance may be attached to the difference between the amounts of adaptation in the readings of the *Rainbow* and *Grandfather* passages, respectively. Such difference as was found may reasonably be attributed to the effect of the successive readings of the *United States* passage, which were interspersed between the first two and the last two readings of the *Grandfather* passage. Some transfer of the adaptation effect involved in the *United States* readings to the last two *Grandfather* readings may reasonably be inferred.

The C. R. of 0.3 in Table III indicates that the adaptation involved in the two speech recordings was not statistically different from that involved in the control readings of the *Rainbow* passage. It is to be inferred, therefore, that there was no transfer of the adaptation effect, occasioned by the successive readings of the *United States* passage, to the last speech recording.

The C. R. of 1.4 in Table III indicates that quite limited significance, if any, is to be attached to the difference in amount of adaptation involved in the *Grandfather* readings and in the speech recordings, respectively.

The coefficients of correlation presented in Table III were computed by the Pearson product moment method, and they represent correlations of distributions of differences. The value of the first one in Table III is .22. It represents a low positive correlation between the amount of adaptation involved in the *Rainbow* control readings and that involved

[9] In computing the C. R.'s, the formula $\sigma M_1 - M_2 = \sqrt{\sigma^2 M_1 + \sigma^2 M_2 - 2r_{12}\sigma M_1 \sigma M_2}$ was used to derive the standard error of the differences, since corrections were made for correlations. See *A First Course in Statistics*, p. 125, by E. F. Lindquist.

in the *United States* readings. For each stutterer there was a difference in per cent of words stuttered in the first two readings of the *Rainbow* and the per cent stuttered in the last two readings of it. The twenty such differences, one for each stutterer, were correlated with the twenty corresponding differences in per cents of words stuttered in the first two and the last two readings of the *United States* passages. It is this correlation that is represented by the coefficient of .22. The other coefficients are to be similarly interpreted. They are all low and of no particular significance, with one exception.

The very high positive correlation of .98 between the differences in per cents of stuttered words between the first two and the last two readings of the *United States* passage and the differences in per cents of stuttered words between the first two and last two readings of the *Grandfather* passage, should be noted. It is clearly desirable that this be checked in further research; if substantiated, it would be of considerable importance. This indicates that, regardless of the total degree of transfer of the adaptation effect from the reading of the one passage to the reading of the other, there appears to have been a very marked tendency for the amount of transfer to vary directly with the amount of adaptation. In other words, the more the reduction in frequency of stuttering with several successive readings of the same passage, the greater was the consequent reduction—though the consequent reduction may not necessarily have been great—in the reading of another passage.

Interesting to note also is the fact that the younger stutterers in the experimental group adapted to the *United States* passage much more rapidly than did the older stutterers. It will be recalled that the conditions governing the repetition were as follows: "The stutterer was stopped as soon as he had read the passage fifteen times (including the two preliminary readings), or he was stopped short of this maximum number of readings provided he gave three consecutive readings of the passage with two, one, or no stutterings in each reading." One of the ten younger stutterers, 11 to 17 years of age, adapted, *i.e.*, fulfilled the conditions as quoted above, by the fifth reading, four by the sixth, one by the seventh, one by the ninth, two by the tenth, and only one made the fifteen readings. In contrast to this, only two of the ten in the older group adapted to the passage prior to making the entire fifteen repetitions. Whether this facility in adaptation of younger stutterers is generally characteristic or whether it is due simply to chance factors in the sample chosen for this experiment, must await further research. It could be suspected that this rapid adaptation is due to the fact that the younger stutterers have had less time to build up strong reactions in relation to certain words and speech sounds than have the adult stutterers; contrary to this, however, it could just as easily be argued (and this has been the experience of the experimenter) that at no other period in life than during adolescence is the stutterer so sensitive to his speech problem and to the possible ridicule of others. The results do indicate, however, that the older stutterers in this experiment have apparently fixated their reactions more on individual sounds and "difficult" words than have the younger group, thus bringing about a slower rate of adaptation.

While most of the subjects in this experiment showed a steady decrease in stuttering frequency with each successive repetition of the *United States* passage, six of them showed interesting variations in stuttering frequency accompanying the repetitions. Stutterer No. 2 dropped from 18.8 per cent stuttered words in reading No. 3 to 13.3 per cent in the ninth reading, and then increased the stuttering frequency to 16.6 per cent in the fifteenth reading. This subject complained of hoarseness at the thirteenth reading. Stutterer No. 17 dropped from 12.2 per cent stuttered words in reading No. 3 to 0.0 in the eleventh reading, and then suddenly increased stuttering frequency to 5.0 per cent in the twelfth reading, and finished with 3.8 per cent in the fifteenth reading. This stutterer made the statement at the tenth reading that "his jaws were locking." Stutterer No. 18 dropped from 25.0 per cent stuttered words in the third reading to 14.4 per cent in the eighth reading, then increased to 22.2 per cent in the thirteenth reading, and ended with 18.3 per cent in the fifteenth reading. This stutterer stated that "he felt his voice changing" and laughed about it considerably between the twelfth and thirteenth readings. (Presumably he was referring to a "catch" in his voice which had developed with the repeated readings.) Sutterer No. 19 showed alternate decreases and increases throughout the readings, beginning with 40.5 per cent stuttered words in the first reading and ending with 36.1 per cent in the fifteenth reading. In the eighth reading his stuttering frequency increased to 42.7, then decreased, and in the thirteenth reading it increased again to 42.2. This stutterer complained of a cough and bad cold. Stutterer No. 20, who consistently showed a decrease in stuttering frequency through the ninth reading and then increased the stuttering somewhat in the tenth and succeeding readings, complained of hoarseness and a "tired throat." Stutterer No. 8, who showed consistent fluctuation throughout the repetitions, was anxious during the experiment for fear he would be late for an appointment, although he was assured that he had plenty of time. He attempted to hurry through the readings, however, and this seems to be the best explanation for the fluctuations that occurred in his case.

The most plausible explanation for the fluctuations in the other five subjects seems to be that "fatigue" entered into the situation, thus counteracting the adaptation effects in certain specific readings, *i.e.*, those in which an increase in stuttering frequency followed a decrease in the preceding reading. Considering the fact that each of these stutterers spoke and read an average of 4,135 words, the possibility that "fatigue" was a factor in the situation is not unreasonable. This interpretation is to be advanced, however, in light of the apparent fact that there are several varieties of "fatigue" and that they may not be equivalent so far as their effects on stuttering frequency are concerned. A study by Curtis (7) has indicated that the sort of "fatigue" that is associated with sheer muscular exertion does not tend to increase stuttering frequency. If "fatigue" was operating in the subjects under discussion, perhaps it was complicated by various "emotional" factors, and it is impossible to say what such factors might have been.

V. SUMMARY

Twenty stutterers were used in this experiment in an attempt to answer the question, "Does the reduction in stuttering frequency with repeated reading of the same passage affect stuttering frequency in other speech situations?"

Each stutterer read a 180-word control passage (the *Rainbow*) four times, the first two and the last two readings being separated by one-half hour, during which the stutterer was engaged in non-reading, "neutral" activity; a similar 180-word passage (the *United States*), fifteen times (or the stutterer was stopped short of this maximum number of readings provided he gave three consecutive readings of the passage with two, one, or no stutterings in each reading); and another 180-word passage (the *Grandfather*) four times, twice before the "repeat" readings, and twice following them. All stuttered words were marked by the experimenter on mimeographed copies of the passage after his observational reliability had been determined. Two four-minute recordings of the "conversational" speech of each stutterer were made, the first just prior to the "repeat" readings, and the second at the end of the experiment.

Using the amount of adaptation (difference in per cent of stuttered words between first and last readings) involved in the control *Rainbow* readings as a base, it was found that there was some transfer (statistical significance somewhat questionable) of the statistically significant adaptation effect occurring in the several successive readings of the *United States* passage, to the reading of another similar passage, the *Grandfather*, but that there was no transfer of the adaptation effect to "conversational" speech. There was, however, a positive correlation of .98 between the per cents of adaptation in the *Grandfather* and *United States* readings, respectively, which indicates a marked tendency for the amount of transfer of adaptation effect from one passage to another to vary directly with the amount of adaptation. That is, the more the reduction in frequency of stuttering with several successive readings of the same passage, the greater was the consequent reduction—though the consequent reduction itself may not necessarily have been great—in the reading of another passage.

The younger stutterers (11-17 years of age) adapted to the *United States* passage more rapidly and to a greater degree than did the older stutterers.

Six stutterers showed wide fluctuations in stuttering frequency during the repetitions of the *United States* passage, and their failure to show as much or as consistent adaptation as the other subjects appeared to be due to some kind of "fatigue," complicated perhaps by "emotional" factors unknown to the experimenter.

VI. CONCLUSIONS

This investigation indicates the following conclusions; namely (a) reduction in stuttering frequency with repeated readings of the same passage does tend to be associated with reduction in stuttering frequency in a similar passage, but (b) that it is not associated with a reduction in stuttering frequency in a "conversational" situation.

In connection with the second conclusion, however, the possibility that factors were present in the recording periods which prevented significant transfer of the adaptation occasioned by the repeated readings of a passage to the "conversational" situation, should be noted. It is to be pointed out that none of the stutterers appeared to be perfectly at ease during the recording periods. Only one stutterer in the experimental group had had his speech recorded previously, and even he appeared "nervous" prior to, and during, the recordings. The recording situation itself, in which the subject was in a sound-proof room, waiting for the apparatus to be adjusted and anticipating the red light which signalled him to begin speaking, was of a nature that might have caused him to become somewhat "rattled." There is the possibility, then, that had the stutterer been speaking in a situation to which he was more accustomed, his speech may have shown adaptive effects in the second "conversational" period. Conclusions must be limited to the tasks involved in the present study. Certain refinements of procedure in future research, in order to eliminate any possible "nervousness" in connection with the recording situation, are indicated. For example, a recording of the speech of a subject could be made without his knowledge—that is, a microphone could be concealed in the experimental room with connections leading to the recording room some distance away. Or the subject could be led into thinking that his speech was not being recorded, i.e., he could be told to "practice" speaking once before the "actual" recording and this "practice" speech could be recorded without his knowledge, thus eliminating some fear of the recording situation.

The conclusion mentioned previously, namely that reduction in stuttering frequency with repeated readings tends to be transferred to the reading of a similar passage, has definite implications for therapy. Here, then, is a procedure to show the stutterer objectively that he can reduce the frequency of stuttered words during reading, and that as a result of repeating a passage a number of times, he can read a similar passage "better"—that is, with fewer stuttered words—than he could have read it without the previous repetitions. Such concrete evidence of "progress" would seem to be helpful to the stutterer in the initial stages of his remedial speech training, when every possible means must be employed to demonstrate to him that his speech can be modified.

Further research dealing with the adaptation effect in stuttering, conducted over a period of several months, might prove especially fruitful to speech therapists. In line with this suggestion, the experimenter has noted, in selecting subjects for this experiment, the fact that many of them who were quite severe in conversational speech read the passage employed in selection of subjects with so few stuttered words that they could not be used in the experiment. All of the stutterers in whom this characteristic was noted had been receiving remedial speech training over a period of years, and part of this remedial work consisted in simply having the stutterer read aloud newspaper and magazine articles and other types of reading material. In view of the possibility that this practice in reading aloud over a period of time had served to give rather severe stutterers, comparatively fluent speech in a reading situation

where an auditor is present, the general problem of the adaptation effect should be investigated intensely. The suggestion of such a possibility is made here chiefly because of the therapeutic significance involved. If by having a stutterer read various passages aloud over a period of several months, an adaptation effect were obtained sufficient to result in reduced stuttering in all or most other reading situations, then obviously the stutterer would be facilitated in a large measure in adjusting to his entire speech environment. It is to be hoped that future experimentation will be directed to this matter.

This investigation has raised several other questions which must await further experimental findings. Briefly, these questions are: (1) Do younger stutterers (approximately 11-17 years of age) adapt more readily to a reading passage than do adult stutterers? (2) Can the fluctuation in stuttering frequency during "repeat" readings of a passage be attributed solely to "fatigue," or must they be explained on the basis of other factors? (3) Will further experimentation substantiate the high correlation of .98 between the amount of adaptation from repetition of one passage and the amount of transfer to another passage, as reported in this study? (4) Is the adaptation effect to be regarded as a type of experimental extinction? This last question serves to raise the more general and theoretically very important question as to the degree to which and in what particular respect stuttering is to be interpreted as learned behavior. Speech pathologists could hardly find a more crucial issue for investigation in the further study of stuttering.

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A STUDY OF CERTAIN FACTORS RELATED TO RETARDATION OF SPEECH*

By Ruth Elizabeth Beckey
Ohio University, Athens, Ohio

Chapter I
NATURE OF THE STUDY

In the beginning, man used his speaking apparatus primarily for breathing, and for the ingestion, mastication, and swallowing of food. Even the larynx functioned to regulate the amount of air entering the lungs. Man gradually assumed speaking habits, however, which have been voluntarily superimposed upon the structures fundamentally intended for the vegetative purposes.

Since speech was, therefore, an over-laid function, the parent or teacher could not always expect perfect development of the speech functions in every child. To produce the finely coordinated movements of speech, the neuromuscular mechanism controlling the speech activities had to be well regulated. To reduce the more generalized biological functions of the peripheral speech mechanism to the highly specialized movements involved in making speech patterns was to place a great responsibility upon the child's central nervous system. In attempting to specialize the general functions of the speech apparatus, the child was often slow or inaccurate in the development of the highly differentiated speech sounds.

The child was not able to make the highly coordinated movements necessary for speech until the ninth or tenth month. After this period, he developed gradually until the age of six, when he was able to say almost all of the sounds accurately. The child was seriously delayed in speech development if he had not started to talk by the age of three. Any number of factors might have been responsible for the child's inability to talk at the normal age.

The Problem

Purpose of This Study. It was the purpose of this study to determine the factors related to delayed speech development. Data relative to the following factors were collected and statistically evaluated: heredity, pre-natal, natal, and post-natal conditions, childhood diseases, brain injuries, physical development, intelligence, behavior, sibling birth order, general physical conditions, environment, and speech habits.

Importance of the Study. Within the last few years increasing attention has been centered on the child who was slow in speech development. From the practical standpoint, this study should contribute to the better understanding of the retardation of speech. Parents should know that slow speech is not always accompanied by low mentality. With

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proper knowledge, the parent might often be able to direct the activities of the child during the speech readiness period to such an extent that speech will develop normally.

From the scientific standpoint, the research student should know what etiological factors existed in the retardation of speech. The student, teacher, and psychologist could more ably outline a program of re-education after knowing some of the factors which might contribute to delayed speech.

Procedure

A detailed clinical study was made of fifty children with retarded speech development, and of a control group of fifty children with normal speech. In order that all factors might remain constant throughout the investigation, the same case history form[1] was used for both the delayed and the control groups. This form included detailed items relative to the enviromental, physical, and psychological aspects of each child.

The family history included data concerning general health, diseases, speech defects, handedness, and mental deficiencies. Pregnancy reports contained information concerning the health of the mother in regard to such factors as the number of months of pregnancy, injuries and falls, glandular deficiencies, and conditions of the heart, lungs, kidneys and bowels. Birth records had data relative to the age of the mother at the birth of child, weight of child at birth, method of delivery, condition of child at birth, length of labor, manner of presentation of the child, and complications such as dry birth and narrow pelvis. The developmental factors which were recorded included the ages at which the child began to creep, to cut his first tooth, to sit, to walk, to talk, and to have voluntary control of bladder and bowels.

Physician's records of each child were checked for defective speech apparatus, for neurological inadequacies, for sight, for hearing, and for glandular deficiencies. Data were also obtained concerning the severity of childhood diseases and the ages of onset.

The habits of the child were recorded from the reports of parents and teachers. Many of these reports were confirmed by the investigator, who lived at the Hill-Young School of Speech Correction for several months and had an opportunity to observe the children with delayed speech during each hour of the day.

The intelligence quotient of each child was ascertained by a competent psychologist. For the children of each group the revised Stanford-Binet scale was used. Those of the delayed group were also given non-language intelligence tests, among which were the Merrill-Palmer and the Goodenough Drawing tests.

Environmental conditions of the home were learned from the parents, from observation of the child with the mother, and in many instances, by actual visits to the home.

In the selection of the cases for the retarded group, the following criteria were used: supposedly normal intelligence with (1) retarded development of speech, or with (2) inhibited speech after a normal beginning, or with (3) unintelligible sound, or gesture, language.

[1] A complete copy of the case history form is in the appendix.

Since cases for the patient group were difficult to secure, several sources were required. Of the fifty cases of retarded speech used in this study, twenty-two were secured from the children of the Hill-Young School of Speech Correction, Los Angeles; thirteen were selected from a group of thirty-eight cases of delayed speech at the California Babies Hospital, Los Angeles; five were found among the records at the Broadoaks Nursery School, Pasadena, California; and the other ten cases were secured from the psychological clinics at the University of Southern California, Los Angeles; Child Guidance Clinic, Los Angeles; Children's Hospital, Los Angeles; and the Orthopedic Hospital, Los Angeles.

In the control group, normal speech development was the main criterion for the selection of the cases. In an attempt to secure a group comparable to the delayed children in regard to ages and socio-economic status, the children from the Broadoaks Nursery School, Pasadena, California, were used. Furthermore, the records of this nursery school were quite complete and adequate for the purposes of this study.

Original data for each case in this study were secured from personal interviews with parents under controlled conditions. The investigator made thirty-four personal contacts with the mothers of the children in the delayed group. The other personal interviews of this group were secured by competent social case workers who were accustomed to making confidential reports of family histories. In addition to the personal interview with the mother, the social worker made several visits to the home of the patient. At the Broadoaks Nursery School, the case histories used in the control group were complete records obtained by the director of the school, who had had years of experience in making private interviews with parents of nursery school children. In each instance the case history was supplemented by the confidential reports of physicians, psychologists, and teachers.

The procedure followed by the investigator in securing the data necessary for this study varied somewhat between the two groups. As has been indicated previously, some of the information was secured directly from the informant; the other data were obtained indirectly from the detailed reports of case workers. However, since the same case history form was used throughout the recording of the data, the factors remained fairly constant.

An attempt was made to secure a control group as nearly equivalent to the delayed group as possible. The main difference between the two groups existed in the rate of language development. Table I indicates that the control group developed speech at the normal age in every instance, whereas the children of the delayed group showed various rates at which speech was acquired.

TABLE I
SPEECH DEVELOPMENT

	No words before 24 months	No sentences before 36 months	No speech before five years
Delayed	25	31	14
Normal	0	0	0

Similarities were sought in respect to age, to socio-economic status, and to intelligence. Members of the two groups were similar in age, varying from two to seven years. In regard to the socio-economic status, the results of the investigation indicated that the parents of the control group tended to be better educated and to be in better occupational groups than those of the experimental group. As a result of language deficiency, the child with retarded speech was unable to make an intelligence rating equal to the child with normal speech development. Though these differences existed, the investigator felt that no group was available that would be comparable to the delayed group in regard to intelligence or the social status of the parents.

Limitations of the Study

Any data which the investigator thought likely to be incomplete or biased enough to be misrepresentative were not evaluated in this study. The recordings of the family histories seemed inadequate from many standpoints, since the parent might not have revealed all of the unfavorable hereditary factors in the family stock. Moreover, the parents of the children with delayed speech might have been particularly sensitive, in many instances, to the possible causes of the speech retardation; yet the same factors might have existed in the histories of the children with normal speech.

In regard to the environment, certain elements which appeared to have an important relation to the slow development of speech could not be checked scientifically without involving too much time for this particular study. Some of these factors included tension in the home, parental attitudes toward the child, and physical adequacy of the environment.

Many behavior problems were omitted from this study even though the data were obtained. Some of the judgments of the parents relative to the behavior items such as negativism, jealousy, and shyness seemed prejudiced or insufficient. Only the data which permitted an objective checking were retained. The study made by Sutter (12) on the behavior of children with delayed speech might be used to supplement the present investigation.

Definition of Terms

Certain expressions that will be used throughout this study will be clarified in the beginning.

1. *Language* is an acquired activity of producing meaningful symbols for the purpose of social communication.

2. *Retarded* or *delayed speech* refers to alalia, infantile perseveration, babbling, jargon speech, hearing mutism, and echolalia.

   a. *Alalia* refers to the complete lack of speech.
   b. *Infantile perseveration* refers to baby-talk continued beyond the normal period.
   c. *Babbling* refers to spontaneous speech with no word meaning.
   d. *Jargon speech* refers to very indistinct and unintelligible speech.

e. *Hearing-mutism* or *auditory imperception* refers to the inability of the child to distinguish speech sounds even though he hears them.
f. *Echolalia* refers to repetitions made by the child who has no speech understanding.

3. *Normal speech development.* To develop normally, according to Gesell (3), the child should say his first words at twelve months after progressing successfully through the various developmental levels. At twenty-one months the child should be able to join two words in a sentence. However, the child is not considered delayed by Gesell unless he is unable to say words after fifteen months and sentences after thirty months.

CHAPTER II
LANGUAGE DEVELOPMENT IN THE CHILD

The factors which delay speech could be understood better with some knowledge of the development of the mechanism necessary to normal speech.

The child's first uses of speaking activities were similar to the functions served by language in the primitive man. In the study made by McCarthy (7), the beginnings of speech in children, as in the early man, were almost entirely emotional in nature. The child was found to respond most frequently by crying and fighting against the situations in his environment relative to his well-being. Many gestures were employed to express his wants and dislikes. However, it was found that these elemental forms of expression decreased as the child developed.

As the child matured emotionally, intellectually, and physically, he learned speech according to the stimulation provided by his environment. He acquired language as his need for communication developed.

Speech Conditioning

Happy situations, surrounding the child, encouraged his speech development through the process of conditioning. For example, conditioning took place when the child learned to say "mama." The mother, thinking that the child was saying his first word, smiled at him. The baby was pleased and said the word again and again when he saw his mother, associating the word with the pleasure of seeing his mother.

Lewis (6) says that the child's early responses to speech may be conditioned by the pleasantness or unpleasantness of the adult's voice and facial expression, by the presence or absence of caresses, and by the satisfaction of his bodily needs. He maintains that the accompanying situation is the important factor. If the conditions are pleasant, an unpleasant voice may have no negative effects.

Stinchfield (14), likewise, claims in her recent book that proper conditioning is an important element in the acquisition of speech responses.

Developmental Periods

The child passed through speech developmental stages, in any one of which development might have been arrested by various factors. In some children the periods of speech growth began earlier than in others

because of more rapid maturation of the nervous system, better intelligence, or certain environmental factors.

The first vocal response of the baby was the birth cry, which was a reflex type of bodily response to chemical stimuli within his organism. During the first month almost all of the child's vocal responses were undifferentiated. After the first month the bodily responses continued to be total reactions to the situations, but the situations varied.

From the third to the tenth month, the child began his vocal play or babbling, which was the source of the spoken language. During this period almost all of the vowels, nasals, labials, gutturals, and dentals were formed successively in order of their difficulty. Bodily responses became highly differentiated and specific. Maturation of the nervous system, through myelination of the neurones, made for better movements in the vocal mechanism. Socialized vocalization in which the child sought attention, expressed his desires, and resisted opposition, began about the fifth month.

The lallation, or sound imitation, period usually began during the sixth month. The child imitated his own sounds for the pleasure he derived from hearing himself. This period was important in the development of the kinesthetic sense of speech.

Following the lallation period was the echolalic period, in which the child imitated the sounds he heard but had no understanding of them. This activity began about the ninth month, when the muscular responses had become finely integrated and capable of making many differentiated speech patterns.

The next stage, or the language comprehension period, occurred long before the child was able to use language correctly. He began to associate words with certain objects. This stage usually started about the beginning of the second year. At this time the child needed to receive proper stimulation to encourage talking. Many of the child's early responses were accompanied with gestures. McCarthy (7) found that the children in her study depended upon gestures for communication long before any speech was acquired. However, if the parent relied upon the gesture language entirely, the child was slow to gain speech.

Many factors might have affected the various rates of language maturity. A normal speech development was usually expected if the child had an average intelligence, good hearing, normal speech mechanism, good muscle coordination, normal growth of brain and nervous system, and adequate stimulation at the time the child was ready to learn speech. However, the results of the present investigation revealed that a number of conditions existed before birth, at birth, or after birth to prevent or interrupt the proper acquisition of speech.

Chapter III

COMPARATIVE DATA CONCERNING RETARDED AND NORMAL GROUPS

The material for this study is organized into the following three main divisions: constitutional inadequacies, environmental deficiencies, and psychological problems.

Constitutional Inadequacies

In this particular phase of the study, the following physical factors were studied: (1) heredity, (2) pre-natal life, (3) birth complications, (4) abnormalities and diseases of the newly-born child, (5) disorders of the brain and nervous system, (6) handedness, (7) infectious diseases, (8) general physical conditions, (9) retarded physical development, (10) defective speech mechanism, and (11) sex.

1. *Heredity.* The hereditary factors which might be related to speech inadequacy are listed in Table II. An observation of the case histories of the two groups showed that the children with delayed speech tended to have more hereditary weaknesses (CR, 2.9). Among the individual items, speech defects (CR, 4.0) and left-handedness (CR, 4.2) were the most important. However, the parents of the children of the experimental group, in their search for the probable causes for the speech delay, might have been particularly sensitive to these elements.

TABLE II

FREQUENCY OF ORGANIC WEAKNESSES IN THE FAMILY STOCK

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR*	Chances in 100†
Incidence of Cases‡	18	36	6	12	24	2.9	99.8
1. encephalitis	1	2	0	0	2		
2. meningitis	1	2	0	0	2		
3. asthma	4	8	0	0	8		
4. diabetes	2	4	0	0	4		
5. syphilis	2	4	0	0	4		
6. epilepsy	2	4	1	2	2		
7. St. Vitus	1	2	0	0	2		
8. glandular	2	4	0	0	4		
9. heart trouble	4	8	2	4	4		
10. T.B.	4	8	0	0	8		
11. cancers	4	8	0	0	8		
12. ear defects	2	4	1	2	2		
13. suicide	3	6	1	2	4		
14. difficulties in reading	3	6	1	2	4		
15. speech defects	18	36	3	6	30	4.0	99.9
16. left-handed	16	32	1	2	30	4.2	99.9
17. ambidextrous	4	8	0	0	8		
18. twins	5	10	2	4	6		
19. mental deficiency	5	10	0	0	10	2.3	98.9
20. insanity	4	8	1	2	6		

*The Critical Ratio is obtained by dividing the difference of the two percentages by the Sigma of the difference. Any ratio of three or more is significant.

†Chances in 100 that the true difference between the percentages of the two groups is greater than zero.

‡Number of cases which had one or more of the factors listed from 1 to 20.

2. *Pre-natal life.* No isolated item in the pregnancy histories of the mothers showed a significant ratio. However, appreciable trends in the health of the mother during pregnancy were indicated in the following

factors: nervousness (CR, 1.7), edema (CR, 2.8), kidney and heart difficulties (CR, 2.5). Table III reveals that multiple factors existed in the pre-natal life of the child with delayed speech (CR, 6.2).

TABLE III
INCIDENCE OF FACTORS IN PRE-NATAL LIFE

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
Abnormal Pregnancy*	34	68	8	16	52	6.2	99.9
1. asthenia	7	14	4	8	6		
2. nervousness	14	28	7	14	14	1.7	96.0
3. edema	7	14	0	0	14	2.8	99.7
4. glands	2	4	2	4	0		
5. falls	2	4	0	0	4		
6. kidney and heart	8	16	1	2	14	2.5	99.4
7. bowels	5	10	0	0	10		
8. infections	4	8	1	2	6		
9. bad teeth	6	12	1	2	10		
10. below age 18	7	14	0	0	14	2.8	99.7
11. above age 34	7	14	5	10	4		

*Incidence of cases which had one or more of the factors listed in items from 1 to 11.

3. *Birth complications.* Multiple factors seemed to exist again in the birth histories of the delayed group (CR, 4.4). As Table IV indicates, dystocia, or prolonged labor, showed the most significant trend among the individual factors investigated in the birth conditions of the children retarded in speech (CR, 2.3).

TABLE IV
ABNORMALITIES OF BIRTH CONDITIONS

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
Abnormal Birth*	34	68	13	26	42	4.4	99.9
1. forceps	8	16	8	16	0		
2. Caesarean	4	8	4	8	0		
3. precipitous	2	4	0	0	4		
4. induced	5	10	5	10	0		
5. breech	4	8	1	2	6		
6. narrow pelvis	6	12	0	0	12		
7. dry birth	6	12	0	0	12		
8. dystocia	18	36	8	16	20	2.3	98.9
9. eclampsia	1	2	0	0	2		
10. cyanosis	1	2	0	0	2		
11. premature	7	14	5	10	4		
12. postmature	1	2	3	6			

*Incidence of cases which had one or more of the factors listed in items from 1 to 12.

4. *Abnormalities and diseases of the newly-born child.* Although several types of disorders existed in the early life of the children with delayed speech, Table V specifies no wide variations between the two groups. The most significant item in the table is asphyxia neonatorium, which refers to a baby who is blue or black at the time of birth (CR, 2.9). No previous research has been made in regard to the abnormalities of the post-natal conditions and their relationship to the delayed development of speech; nor has any such study been made of the prenatal and natal life of the child.

TABLE V
ABNORMALITIES OF THE NEWLY-BORN

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. asphyxia	8	16	0	0	16	2.9	99.8
2. jaundice	1	2	1	2	0		
3. toxic rash	1	2	0	0	2		
4. large head	3	6	0	0	6		
5. convulsions	2	4	0	0	4		
6. difficult breathing	7	14	4	8	6		
7. weak pulse	1	2	0	0	2		
8. under 5½ pounds	6	12	5	10	2		
9. pyloric stenosis	1	2	0	0	2		
10. congenital heart	1	2	0	0	2		

5. *Disorders of the brain and nervous system.* Information concerning the coordinations of the child's neuro-muscular mechanisms was obtained from the observations of parents, teachers, and the investigator. In a few instances, neurological reports were given by the physician. Table VI shows the lack of motor coordination to be a significant factor among the children with delayed speech (CR, 3.3). Brain injuries and diseases of the nervous system proved to be unimportant in this study.

TABLE VI
BRAIN AND NERVOUS DISORDERS

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. meningitis	1	2	0	0	2		
2. encephalitis	4	8	0	0	8		
3. hydrocephalic	2	4	0	0	4		
4. brain injury	4	8	0	0	8		
5. convulsions	4	8	0	0	8		
6. adventitious brain injury	9	18	4	8	10		
7. poor motor control	9	18	0	0	18	3.3	99.9

Froschels (2) writes that injuries are the common causes for the loss of speech in both adults and children. He also indicates that tumors of the skull and acute infections may affect the brain in some instances.

6. *Handedness history.* In the present study no significant results were obtained on handedness. However, the delayed group tended to be somewhat more ambidextrous than the control group (CR, 1.7). The data for this part of the investigation were secured from statements made by the parents after much questioning by the interviewer to determine whether handedness had been definitely established. No handedness tests were actually given.

Several studies have been made to determine the relationship between handedness and speech defects. Nice (9) found seven cases of delayed speech in which ambidextrous tendency seemed to be a constant factor. Orton (10) and Travis (17), who have probably made the greatest contribution to the study of handedness in relation to speech problems, found that children with speech defects tended to lack hand preference.

TABLE VII
HANDEDNESS HISTORY

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. right	28	56	37	74			
2. left	7	14	5	10	4		
3. ambidextrous	15	30	8	16	14	1.7	96
4. changed hands	2	4	1	2			
5. writes backwards	3	6	0	0	6		

7. *Infectious diseases.* In this investigation, the normal group and the delayed group showed about the same number of cases having at least one disease before the age of six. However, a further study of the case histories revealed that more children of the delayed group had two or more of the infectious diseases (CR, 3.0). The isolated infectious disease of measles showed a significant ratio (CR, 3.3).

TABLE VIII
SEVERE INFECTIOUS DISEASES

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. measles	15	30	3	6	24	3.3	99.9
2. scarlet fever	1	2	0	0	2		
3. varicella	9	18	8	16	2		
4. pertussis	18	36	12	24	12	1.3	91.0
5. parotitis	3	6	1	2	4		
6. influenza	5	10	8	16			
7. meningitis	1	2	0	0	2		
8. two or more*	15	30	4	8	22	3.0	99.9

*Two or more of the listed diseases.

Stinchfield (14) and Van Riper (18) made investigations in regard to diseases of childhood as related to slow speech development. These studies, however, were compared with no control group of normal speaking children. Van Riper found that thirty per cent of the sixty

cases of baby-talk which he studied had severe illnesses during the first few years. Stinchfield's observation of the twenty-three children with delayed speech also showed tendencies toward more diseases during the early years. In agreement with the findings of this study, she also found that measles was a frequent disease among children with retarded speech.

8. *General physical condition.* Various organic defects of body structures and their functionings were learned from the study of physician's records. Poor general health was found to be the most outstanding single item (CR, 3.0). It is also indicated by Table IX that the child with delayed speech tended to have glandular difficulties (CR, 2.8). No other constitutional inadequacy in regard to the child's general physical condition was found to be important.

TABLE IX
PHYSICAL CONDITION

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. poor health	8	16	0	0	16	3.0	99.9
2. glandular	14	28	1	2	26	2.8	99.7
3. undescended testicles	2	4	0	0	4		
4. hernia	3	6	0	0	6		
5. spinal curvature	2	4	1	2	2		
6. anemia	1	2	0	0	2		
7. broken bones	6	12	6	12	0		

9. *Retarded physical development.* It was noted that the maturation of the large muscular mechanisms necessary for walking was delayed until after the fifteenth month in a significant number of the language-retarded children (CR, 3.7).

Moreover, Table X points out tendencies toward slow dental growth (CR, 2.9), and late voluntary control of bladder (CR, 1.7) and bowels (CR, 1.8) in the group of the children with slow speech development. The child was not considered slow in teething unless he failed to cut his first tooth by the age of nine months. Voluntary control of bladder and bowels was normally expected by the age of two and one-half or three years.

TABLE X
RETARDED PHYSICAL DEVELOPMENT

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. walking	11	22	0	0	22	3.7	99.9
2. teething	17	34	2	4	30	2.9	99.8
3. creeping	5	10	0	0	10		
4. sitting	5	10	0	0	10		
5. bowel control	8	16	1	2	14	1.7	96.0
6. bladder control	9	18	1	2	16	1.8	96.0

The studies of Van Riper (18) and Mead (8) agree with the findings of this phase of the investigation. They found correlation between retarded speech development and slow physical growth. Thirty-five per cent of Van Riper's cases were slow in dental, physical, or coordinated development. Mead's results showed that the children deficient in language development and intelligence were two months slower in beginning to walk than the children of the normal group.

10. *Defective speech mechanism.* Only organic defects of the speech apparatus were studied in this section. No attempt was made to secure audiometric reports on the hearing deficiencies of each child. Table XI reveals no significant findings in regard to tonsillectomies (CR, 1.4) or defects of the ears (CR, 1.5) and eyes (CR, 1.5), but the combined data regarding diseased tonsils and tonsil operations gave a convincing ratio (CR, 4.4).

TABLE XI
DEFECTIVE SPEECH APPARATUS

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. aural	12	24	4	8	16	1.5	93.0
2. eyes	9	18	4	8	10	1.5	93.0
3. malocclusion	8	16	6	12	4		
4. T. and A.*	10	20	5	10	10	1.4	92.0
5. tonsils†	23	46	5	10	36	4.4	99.9
6. adenoids	19	38	5	10	28	3.5	99.9

*Tonsils and adenoids have been removed.
†Combined data regarding tonsils which were diseased or were removed.

Hearing acuity among the children with delayed speech has been investigated to some extent by Stinchfield (14). Her results indicated a general reduction of about 30 per cent hearing loss for the entire range of sounds.

11. *Sex distribution.* Although sex was disregarded in the selection of cases, the final results showed that the boys exceeded the girls in the delayed group. After the data had been compiled, the normal group was found to have fairly equal distribution of sexes. Table XII reveals a tendency for the boys to outnumber the girls in language retardation (CR, 1.9).

TABLE XII
SEX DISTRIBUTION

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
Male	33	66	24	48	18	1.9	96.0
Female	17	34	26	52			

Speech authorities have generally agreed that boys have more difficulty with speech than girls do, yet this study of delayed speech shows no significant ratio between the two groups. Rosanoff (11) accounts for the difference between the two sexes as being due partially to the hereditary vulnerability of the nervous system of the boy.

Environmental Deficiences

Certain factors of the environment which seemed to affect the child's acquisition of speech were investigated. This part of the study included the occupation and education of the father, sibling birth order, severe fright, isolation, bi-lingualism, broken home, and anticipation of wants of the child by his parents.

1. *Socio-economic groups.* It was found that children with language retardation usually belonged to the lower socio-economic groups (CR, 4.3). The reverse was indicated for the children of the normal group whose parents represented most frequently the professional and managerial occupations (CR, 4.2).

TABLE XIII
OCCUPATIONAL GROUPS*

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. profession	17	34	26	52	18		
2. managerial	9	18	19	38	20	4.2†	99.9
3. skilled labor	16	32	3	6	24		
4. semi-skilled	2	4	1	2	2	4.3‡	99.9
5. unskilled	6	12	1	2	10		

*After Barr's Rating Scale.
†Critical ratio includes evaluation of items 1, 2.
‡Critical ratio includes evaluation of items 3, 4, 5.

Gesell (4), Smith (15), and McCarthy (7) agree with these findings which indicate that language development is better among the upper social levels.

2. *Education of the parents.* Children with delayed speech had parents with an inferior educational background to the children with normal speech development (CR, 2.7). This finding supplements the results shown in the previous table in regard to the socio-economic groups.

TABLE XIV
EDUCATION OF PARENTS

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. college	23	46	36	72			
2. high school	19	38	14	28	10	2.7*	99.6
3. grade school	8	16	0	0	16		

*Critical ratio includes the combined evalutions of items 2, 3.

3. *Sibling birth order.* No significant findings occurred in the study of birth order as a factor in delayed speech. The child with speech retardation, however, tended to be the youngest child (CR, 1.7).

The results, as indicated by Table XV, may appear to disagree with many of the findings already made on this particular factor. Although Smith (15) found that birth order had very little influence upon speech

acquisition, her study revealed that the youngest child tended to speak earlier. Jones and Hsaio-Hung Hsaio (5) found no systematic tendencies for the later-born child to be superior in language development. They made no attempt to find if the youngest child was retarded in speech. Davis (1) concluded that single children were superior in language development.

TABLE XV
SIBLING BIRTH ORDER

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. youngest	21	42	13	26	16	1.7	96.0
2. oldest	7	14	15	30			
3. only	15	30	18	36			
4. intermediate	7	14	4	8	6		
5. youngest or only	36	72	31	62	10		

4. *Unfavorable environment for speech development.* Conditions of the child's environment were determined from the statements and judgments of the mothers. Although some other factors were considered more important in the causation of slow speech development, only such elements as could best be measured by the interview method were retained for this observation of the unfavorable features of the child's speech environment. Severe fright (CR, 3.5), isolation (CR, 3.5), and anticipation of the child's wants by the parents (CR, 6.3) were found to be significant unfavorable influences. Effects often caused by bi-lingualism and broken-home conditions had no relationship to the child with delayed speech. In accordance with the results of this study, McCarthy (7) also found no important effect of bi-lingualism upon speech development.

TABLE XVI
UNFAVORABLE ENVIRONMENTAL INFLUENCES

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. isolation	18	36	1	2	34	3.5	99.9
2. severe fright	10	20	0	0	20	3.5	99.9
3. bi-lingual	3	6	2	4	2		
4. broken home	6	12	3	6	6		
5. anticipation*	22	44	0	0	44	6.3	99.9

*Anticipation of child's wants by parents.

Psychological Problems

In the psychological division the following factors were investigated: (1) intelligence, (2) behavior difficulties, (3) unfavorable speech habits, and (4) interruption of speech development which began normally.

1. *Intelligence.* General ratings of intelligence for the two groups are given in Table XVII. Although the Stanford-Binet scale was administered to each case of the two groups, and intelligence quotients were

assigned in each instance, the examining psychologist usually placed a question-mark after the scores of the speechless children. On the basis of her judgments, many ratings of the delayed group, as Table XVII indicates, were marked as indeterminate. Therefore, due to this difficulty of assigning definite intelligence quotients to the language-deficient child, the table denotes a tendency for the child with retarded speech to be inferior in intelligence to the child of the control group (CR, 6.2).

TABLE XVII
INTELLIGENCE RATINGS

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. superior	5	10	37	74			
2. average	13	26	12	24	2		
3. below average	10	20	1	2	18	2.0	98.0
4. indeterminate	22	44	0	0	44	6.2	99.9

Stinchfield's (14) investigations revealed that after some language was acquired, the intelligence ratings often were raised appreciably. This finding was contradictory to the commonly accepted idea that slow speech was usually indicative of low intelligence. Smith (15), McCarthy (7), Mead (12), and Town (16) found a positive correlation between defective speech and mental retardation.

2. *Behavior abnormalities.* To give a detailed account of the various behavior problems of the delayed group was not the purpose of this study. However, some poor habits were studied and shown in the following table. As will be observed, the child with retarded speech tended to play alone (CR, 2.4) and to cry easily (CR, 2.9). It was found that temper tantrums, thumb-sucking, and enuresis were not significant factors.

TABLE XVIII
BEHAVIOR PROBLEMS

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. temper tantrums	21	42	18	36	6		
2. fears	24	48	24	48	0		
3. sucks thumb	11	22	8	16	6		
4. cries easily	18	36	6	12	24	2.9	99.8
5. plays alone	17	34	7	14	20	2.4	99.2
6. enuresis	13	26	9	18	8		
7. wants attention	6	12	23	46	34	4.0*	99.9

*Critical ratio refers to the normal group.

Observation of the children by the investigator, and the consultation of teacher's records revealed that children with delayed speech do not want attention (CR, 4.0). This finding agrees with the experience of speech teachers who report that speech-retarded children are negativistic and reticent in any situation necessitating speech responses.

Finicky food habits, constipation, sleeplessness, and enuresis were found by Stinchfield in her study of the children at the Hill-Young School. She writes that the speech defect is believed to be closely related to the etiology of the behavior problem.

The most comprehensive studies on behavior of children with delayed speech have been made by Sutter. Her first study (13) gave a description of eight children with delayed speech. She concluded that (1) few child-like vocalizations were made, (2) each child played by himself, and (3) an unusual amount of physical activity existed. A later investigation (12) compared the behavior reactions of thirteen children without speech with a control group of thirteen children with normal speech on ninety-six different traits. Her results indicated that the thirteen children with delayed speech approximated the normal group in only ten of these traits. Her conclusions were based upon subjective ratings secured through controlled observations of the children.

3. *Unfavorable speech habits.* Behavior, which is characteristic of abnormal speech development, is shown in Table XIX. Substituting gestures for speech (CR, 7.3) and poor articulation (CR, 3.4) were the significant factors. Some tendency toward stuttering existed to a small extent in the two groups. In several instances, the children who began to talk after the age of four or five developed shrill, hollow, or whispered voices. An emotional block, usually caused by extreme fright, shyness, or negativism, was the most adequate description of the speech situation of three children of the delayed group. Other children who were not talking, however, might have been suffering from some deep-seated emotional conflict, also. These various factors were determined by questioning the mothers and through observation of the child during his play activities.

TABLE XIX
UNFAVORABLE SPEECH HABITS

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. gestures	26	52	0	0	52	7.3	99.9
2. defective articulation	23	46	8	16	30	3.4	99.9
3. stuttering	4	8	5	10			
4. abnormal pitch	3	6	0	0	6		
5. emotional block	3	6	0	0	6		

4. *Inhibition of speech development.* Of the delayed group, ten cases began to speak at the normal age, but were interrupted for various reasons as indicated in Table XX. Each case, however, gave histories of other factors which might have been the precipitating cause for the interruption of the speech development.

TABLE XX
FACTORS INTERRUPTING SPEECH IN THE DELAYED GROUP

Case	How speech was interrupted in the ten cases who began to speak normally
1.	badly frightened at two when a burning rag caught in hair
2.	encephalitis at two

3. fell on milk bottle at 18 months and cut artery in neck
4. grandmother anticipated child's wants from ages 14 to 24 months
5. tonsil operation at 23 months
6. stopped at two years of age for no particular reason; temper tantrums began at the same time
7. stopped short time while learning to walk
8. had severe whooping cough at two years of age
9. too much isolation when child was learning to talk
10. measles and high fever at two years of age

Evidence of Multiple Factors

An analysis of the data for this investigation indicates that three or more factors were operating in almost all of the cases of the delayed speech group. For example, one case had a record of defective intrauterine existence, an instrument birth, late walking, severe fall on milk bottle at one and one-half years, wants anticipated by parents and oversolicitous grandparents. The child's history also revealed that his father had been slow in learning to talk. His nervous system was probably more vulnerable to the later post-natal shocks, as a result of abnormal pre-natal and natal life.

A study of the case histories of the delayed group revealed no case without some contributing factor to the abnormality of the child's development, yet the normal group had only two cases with no factors operating. This observation signifies, possibly, that one factor alone

TABLE XXI
INCIDENCE OF CASES HAVING ONE OR MORE FACTORS* PRESENT IN THEIR HISTORIES

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. no factors	0	0	2	4			
2. one factor	2	4	18	36			
3. two factors	6	12	20	40			
4. three or more	42	84	10	20	64	8.3	99.9

*Factors used for this table include abnormalities of heredity; pre-natal, natal, and post-natal life; poor environmental conditions for encouragement of speech; intelligence; hearing; and neurological condition.

was not sufficient to produce delayed speech; several factors were necessary. Some of these factors might have been primary causes for producing fundamental weaknesses which were susceptible to later traumatic shocks to the central nervous system sufficient to have curtailed the normal flow of speech.

Summary of the Case Histories

The concluding table of this study presents a summary of the principal groups of factors and some of the individual factors which seemed to have been the most representative of the causal elements of the retardation of speech.

The first six general items in Table XXII show the incidence of the cases of the delayed and control groups which had one or more factors related to heredity, pre-natal, natal, and post-natal life, development, and diseases. The conditions of the mother during pregnancy (CR, 6.2) and at birth of the child (CR, 3.5), and of the child during the first few weeks after birth (CR, 3.5) seemed to be precipitating elements of speech retardation.

Slow walking, retarded dental growth, and late control of bowels and bladder were developmental factors which showed correlation with defective speech development. This fact indicated, possibly, that speech could not develop until the large muscular mechanisms had matured.

Severe fright (CR, 3.5) and isolation (CR, 3.5) were significant individual elements of the environment which appeared to contribute to the delay of speech development. Only one severe infectious disease during the early years of the child's life showed no relationship to this study of the factors involved in the production of speech retardation. Two or more diseases occurred among the children with delayed speech (CR, 3.0).

A summary of the cases in regard to intelligence revealed that a large percentage of the children with delayed speech could not be assigned definite ratings in intelligence (CR, 6.2). According to Table XXII, sibling birth order had no signficance in its relation to delayed speech.

TABLE XXII

SUMMARY OF CONSTITUTIONAL, ENVIRONMENTAL, AND PSYCHOLOGICAL FACTORS IN HISTORIES

Items	Delayed N	Delayed %	Normal N	Normal %	Diff. of %	CR	Chances in 100
1. heredity	18	36	6	12	24	2.9	99.9
2. pre-natal	34	68	8	16	52	6.2	99.9
3. natal	34	68	13	26	42	4.4	99.9
4. post-natal	23	46	9	18	28	3.5	99.9
5. development	27	54	3	6	48	6.2	99.9
6. diseases*	15	30	4	8	22	3.0	99.9
7. birth order (youngest)	21	42	13	26	16	1.7	96.0
8. severe fright	10	20	0	0	20	3.5	99.9
9. isolation	18	36	1	2	34	3.5	99.9
10. broken home†	6	12	3	6	6		
11. intelligence	22	44	0	0	44	6.2	99.9
12. behavior problem	45	90	46	92			

*Two or more diseases.

†Indeterminate intelligence.

The combined results on the behavior problems of the two groups showed no outstanding differences. Each case of the two groups tended to have two or more of the following problems: temper tantrums, fears, thumb or finger sucking, crying spells, shyness, isolated playing, enuresis, masturbation, nail-biting, jealousy, mother-attachment, poor eating

habits, destructiveness, extreme negativism, daydreaming, nervousness, and nightmares. This information was obtained by questioning the mothers, teachers, and case workers, in addition to the observations by the investigator. Although this result showing the similarity of the behavior between the two groups is contradictory to what might be expected, it must be remembered that experiments in child psychology indicate that all children of pre-school years have many behavior problems.

In the final analysis, the findings of Table XXII indicate no particular factor or group of factors which is definitely responsible for delayed or retarded speech.

Chapter IV
SUMMARY AND CONCLUSIONS

This study was undertaken to determine what factors were related to retarded speech development. Since very few investigations had been made on delayed speech, the present study sought to investigate the problem from every possible approach.

More specifically, the research was approached from the physical, environmental, and psychological standpoints. Relative to the physical condition of the patient, such factors as deficiences of heredity, abnormalities of pre-natal, natal, and post-natal life, slow physical development, and adventitious diseases and injuries were investigated. Since speechless children have symptoms similar to the adult aphasic, whose difficulty is known to be the result of lesions in the speech centers, various traumatizing factors were studied particularly to ascertain if the child might not also be suffering from an injury to the nervous system. These factors included: (1) mother's age at subjects's birth, (2) subject's order of birth, (3) duration of labor, (4) complications at birth, (5) maturity at birth, (6) adventitious brain injuries, and (7) infectious diseases.

From the environmental viewpoint, the following factors were studied to determine their possible effect upon the etiology of retardation of speech: (1) socio-economic groups, (2) subject's birth order, (3) isolation, (4) severe fright, (5) bi-lingualism, (6) broken home, and (7) anticipation of wants of child by parents.

Intelligence, emotional difficulties, behavior problems, and unfavorable speech habits were ascertained from the psychological approach.

A clinical analysis of fifty delayed speech cases was made and evaluated statistically. A corresponding study of fifty normal children was also made to determine what factors were common to the two groups and what factors differentiated them. These two groups were compared both by the descriptive and statistical methods. The cases included in this study ranged in age from two to seven years.

Summary of Findings

The incidence of physical factors related to delayed speech were evaluated with the following significant results:

1. Mothers of the delayed speech children often had abnormal pregnancies (CR, 6.2).

2. Mothers who had birth complications tended to have children with delayed speech (CR, 4.4).

3. Asphyxia neonatorium (blue or black baby at birth) occurred in more of the children of the delayed group (CR, 3.2).

4. Poor motor control was indicated in a larger number of the children with retarded speech (CR, 3.3).

5. Children with delayed speech frequently had two or more of the severe infectious diseases (CR, 3.0).

6. Measles was a frequent disease among the delayed speech children (CR, 3.3).

7. Slow physical growth was present in many children of the retarded speech group (CR, 5.8).

8. Children with delayed speech tended to have tonsils which were diseased or removed (CR, 4.4).

9. Adenoids were often present in children of the retarded speech group (CR, 3.5).

10. Boys tended to outnumber girls in language retardation (CR, 1.9).

In order to determine the role of the environment as an etiological factor of delayed language development, certain items were investigated with these results:

1. Children of the delayed group had too much isolation for the encouragement of speech (CR, 3.5).

2. Fathers of the children of the retarded speech group frequently belonged to the lower socio-economic groups (CR, 4.3).

3. Severe fright was found to be a factor among the children with delayed speech (CR, 3.5).

4. Anticipation of wants of the child occurred quite often among the parents of the delayed speech children (CR, 6.3).

From the psychological factors that were investigated to ascertain their bearing upon slow speech development, the following findings were obtained:

1. Children with delayed speech did not want the type of attention which called for a speech response (CR, 4.0).

2. The language-deficient children usually made inferior ratings in intelligence (CR, 6.2).

3. Defective articulation was frequent among the children with delayed speech (CR, 3.4).

4. Children of the delayed speech group were sometimes inhibited after normal speech had begun (CR, 3.5).

5. Substituting gestures for speech was frequent among children with delayed speech (CR, 7.3).

An analysis of the material in this investigation indicated that three or more factors were operating in 84 per cent of the case histories of the children with delayed speech, and in only 20 per cent of the normal group (CR, 8.3).

Conclusion

As a result of the study of the various factors which seemed to be instrumental in the production of speech retardation, certain conclusions and recommendations are attempted.

In general, it may be said that no specific factor or group of factors was found to operate as the etiological element in the retardation of language development. Even in the cases in which normal speech was interrupted by some inhibiting condition, the history of each child revealed other organic factors which might have made the nervous system more susceptible to the later shocks or infectious diseases. What may have been the particular cause for delayed speech in one child may not have been the same for another. Since no one particular item appeared to be the only reason for the slow growth of the speech function, no definite recommendations could be made to the teachers or parents of the child with delayed speech.

However, the various physical, environmental, and psychological abnormalities of the speechless child may be considered from the standpoint of their prevention and re-education. It would be difficult to point out to the mother how to avoid some of the complications of pregnancy and birth which seemed to be closely related to the retardation of speech. Some of these conditions are unavoidable even with a physician's best care. However, the knowledge of all the elements which may have caused the child's constitutional weaknesses may tend to make the parents and teachers more considerate of his inadequacies.

Not until it is possible to determine whether or not the speechless child has some brain injury, can the research student state definitely what precipitates the inhibition of the speech processes. There has yet been no means of ascertaining if, or how much, the child's speech centers have been affected. Since some of the children with delayed speech had poor motor control, injuries to the central nervous system were suspected. Prolonged labor during birth of the child may have produced an intracranial hemorrhage which would cause brain damage. Early forceps delivery may have avoided this damage done by the difficult labor.

In addition to possible cerebral birth injuries, various lesions of the brain and nervous system may have occurred as a result of some severe infectious disease. Of all the diseases, measles appeared more frequently among the children with delayed speech. Measles has been known to cause lesions in various parts of the neural structures.

Although this investigation showed no signficant conclusions in regard to handedness and slow speech development, the child with delayed speech tended to lack hand preference. Since speech is supposed to be a function of the dominant hemisphere of the brain, the early establishment of a hand preference naturally will lead to greater language facility.

Since the parents of the children with delayed speech belonged quite frequently to the lower occupational and educational groups, it appeared that the environment was important in the stimulation of speech. However, this result did not denote that the parents of the skilled labor class with a grade school education necessarily lacked ability in pro-

ducing proper speech encouragement for their children. It may be that the parent of the child in the better groups had more time to talk and play with the child. Busy parents were likely to leave a good baby alone too much. Of course, if the child heard no speech, he could learn no speech.

Other parents anticipated the wants of the child in such a way that the child felt no need for speech. He succeeded in having all of his needs fulfilled through the use of numerous gestures and grunts. The mother and father were often pleased with this type of expression and felt that the child was a cute little actor. The continuation of such practice, however, delayed the speech development.

Closely related to the anticipation of the child's wants was the over-solicitous anxiety of the parents, and grandparents sometimes, to do too much for the child. The activities of the home seemed to revolve around his every whim, and he was rarely punished. This over-attention was indicated to some extent by the sibling birth order, and by the age of the mother when the child was born. Extremely young mothers, using immature judgment, encouraged infantile perseverances in the child who failed to develop speech. That the speechless child tended to be the youngest might signify that the parents and other members of the family were more solicitous of him.

Certain psychological factors, such as tension in the home, parental attitudes toward the child, and the adequacy of the physical environment were felt to have a direct bearing on the causation of speech retardation, but they were considered too difficult to measure in this particular study.

Although the common opinion among many writers has been that the speechless child is mentally deficient, parents need not form such a conclusion to the exclusion of all the other possible factors affecting their child's inadequacy in speech. Without speech the child cannot reveal his intelligence. Intelligence and language must maturate together. As one study shows, the mental age increased after the child had begun to talk.

It is not the purpose of this paper to discuss in detail all the methods for the re-education of the speechless child. However, some suggestions could be given to the parents of the child with slow speech maturation. Early speech development may be encouraged through the utilization of these various means: (1) repetition of the baby's babblings, (2) creation of pleasant situations to accompany the learning of the first words, and (3) use of short sentences with simple words. If the child has not developed speech by the age of two and one-half or three, the parent should obtain the counsel and help of some speech specialist. Furthermore, an early treatment of the case will reduce the possibilities of developing personality maladjustments.

The three methods of approach for the treatment of the speechless child are through the auditory, visual, and kinesthetic senses. The child must be able to hear speech, to see speech, and to feel speech if he is to develop properly. However, a physical inadequacy in any one ability may have delayed the child in developing speech at the normal age. Hearing acuity may have appeared normal to the casual observer, but

any deficiency in the high frequency ranges may have prevented the child from interpreting certain sounds. Children who cannot learn speech by the auditory or visual methods, must be taught through the application of the moto-kinesthetic treatment.

Recommendations

Since the present study was a survey of all the possible factors which might have been related to delayed speech, no detailed analysis of any isolated element was made. However, such a study suggests many opportunities for supplementary research.

In order to substantiate some of the findings of this investigation, additional studies related to speech retardation could be developed in regard to the pregnancy histories of the mothers, birth conditions of the child, throat operations before the age of six, glandular deficiencies, and childhood diseases. Such factors as parental tensions and attitudes, sufficiency of the physical environment, and inadequacy of parental control might be operating insidiously in developing various emotional conflicts producing speech inhibitions. These subtle psychological phases of the child's environment can only be ascertained by frequent interviews with both parents, and by observations of the child in his home.

Research should be continued further in regard to intelligence and the child with delayed speech. As language development is so closely related to the maturation of the intellectual processes, the child might be observed over a period of several years in order to ascertain more conclusively that mental deficiency is not the major factor in all cases of speech retardation.

Moreover, audiometric reports could be made of a sufficiently large number of children with delayed speech to determine the importance of frequency losses in hearing. If at all possible, the organic conditions which caused the aural deficiency should be ascertained from physician's examinations. Some investigation should also be made to find out if any lesions actually exist in the speech and hearing centers of the brain.

As this study has indicated, many factors might be operating successively or simultaneously to delay the child's development of speech. Therefore, the problem for the future research student is not to isolate the one element causing the delayed speech, but to find what factors are precipitating the inhibitions of the speech processes, and what factors are contributing to its continual retardation.

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CASE HISTORY FORM

Name..... Sex..... Race.....
Place of birth..... Date of birth.....
Occupation of parent..... Education of parents.....
..... Address..... Siblings.....
(no. and ages)

FAMILY HISTORY: Has any member of the family ever had a speech defect..... who..... what type.....
Have any members of the family ever been left-handed.....
who..... any twins..... ambidexterity.....
cross-eyed..... have any members of the family had syphilis, mental deficiency, epilepsy, insanity, queerness, convulsions, St. Vitus dance, abnormal size, drug addiction, difficulties in reading, spelling, writing .....
.....
.....
.....

PREGNANCY HISTORY OF MOTHER: What age was the mother at the birth of the child..... number of months of pregnancy..... weight of the child at birth..... what was the mother's health when she was carrying the child..... did she gain or lose weight..... did she suffer from dizzy spells ..... fainting spells..... did she receive any injuries or falls or other accidents..... did she sleep well or poorly..... was she very nervous..... did she have any trouble with heart or lungs..... did she have any trouble with glands..... did she have any trouble with kidneys or bowels..... did she have any infections while she was carrying the child..... inflamed teeth..... loss of hair..... swelling in legs..... illnesses or diseases..... operations.....

BIRTH CONDITIONS: Was the mother's pelvis narrow..... how long did the labor last (first pains to the expulsion of the after-birth)..... what was the shape of the baby's head at birth..... was the baby delivered feet first, head first, or by Caesarean section..... did the child cry immediately after birth..... for how long..... was the child hard to arouse from sleep..... did he sleep unusually long periods of time..... for how long..... did the child ever have convulsions..... at what age..... how frequent..... why..... how long did they last..... when was the last..... was the child ever unable to move his legs, arms, or other parts of the body..... did he have difficulty in breathing at birth..... did a doctor or midwife attend..... neither..... were forceps used in delivering the child..... if so, were the forceps applied high..... low..... did they leave any scars on the head..... did he nurse as soon as he was placed at the breast or did he need to be coaxed..... how long did this condition last..... was the baby's pulse strong, weak, slow, fast, normal..... was any anesthetic given to the mother..... kind..... how long..... was there any water with the baby at birth or before birth.....

CHILDHOOD DISEASES AND PHYSICAL CONDITION: Has the child had any of the following diseases—

	age	serious	mild	effects
tonsilitis				
brain fever				
sleeping sickness				
measles				
scarlet fever				
whooping cough				
mumps				
influenza				
pneumonia				
rickets				
enlarged glands				
tuberculosis				

Are any of the speech organs defective, such as lungs, teeth, tongue, throat, lips..... what effect on speech.....
..... has the child ever been seriously injured.....
age..... how..... has the child ever been knocked unconscious..... did he suffer from dizzy spells.....
did he ever complain of seeing specks before his eyes.....
did the child want to vomit often..... has he ever had tonsils or adenoids removed..... when.....
has the child a defect in hearing..... seeing.....
is the child usually in good health.....

DEVELOPMENT: Was the child's rate of growth seemingly normal.....
Give the ages in months at which the following took place:

first tooth.....full set of teeth.....
second teeth.....creeping on all fours.....
sitting alone.....walking alone.....
feeding self.....use of spoon.....
voluntary control of bladder.....
voluntary control of bowels.....

HABITS: Did the child ever suck his thumb..... how long..... has the child wet the bed.....how long..... has he ever had a bad emotional shock such as a terrible fright..... did he cry easily..... were his feelings easily hurt..... any evidence of temper tantrums ..... jealousies..... crying spells.....
does he have any particular fears, such as fear of the dark, animals, etc..... what are they..... does he have his own room..... does he sleep alone.....
does he get along well with his family and the children of the neigh-

borhood..... if not, what is the nature of the difficulty..... is there any family friction (money, religion)..... does the child play with anyone..... or prefer to play alone..... which parent does the child prefer..... why.....

INTELLIGENCE: Has the child ever had a mental test..... name of the tests..... I. Q.....

SPEECH HISTORY: How old was the child when he began to say his first single words..... simple sentences..... what were his first single words..... how was the child taught to talk..... who did most of the teaching..... was the child over-stimulated..... were his wants usually anticipated before he could communicate the need..... did the child gesture too much..... were there any sounds that he could not say..... which..... *did the child lisp*..... *describe*..... was the child taught to say pieces in front of strangers..... any marked articulatory defect..... describe the rate, intensity, and pitch of the child's speech..... did the child tend to say words backwards ("got for" instead of "forgot")..... was the child very talkative..... how many languages were spoken in the home..... what..... what languages does the child speak ..... which did he learn first..... are there any deaf people in the child's immediate family..... did the child ever have more speech than he does now..... has the child ever uttered words under strong emotion which he has never said since..... has the child ever been punished for speaking or during speech..... is the child ambidextrous ..... left-handed..... what people did the child dislike during his first two years..... was the child jealous of anyone..... did the child use silence to gain attention..... was the child isolated too much..... what is the attitude of the parents toward the child and his trouble..... .....if the child stutters, give characteristics of the stutter.....

ENVIRONMENT: Has there been any unhappiness in the home due to death..... separation..... etc..... what type of play does the child do..... indicate any other items that seem pertinent to this subject's case history:

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A STUDY OF THE ONSET AND DEVELOPMENT OF STUTTERING[1]

WENDELL JOHNSON, *et al.*
University of Iowa

I. INTRODUCTION

This study deals with the general problem of the onset and early development of stuttering; the specific questions which it considers are implied in the statement of findings. Previous studies and theoretical statements by Bluemel (1), Froschels (4), Van Riper (7), Johnson (5), Steer (6), Davis (2) and Egland (3) have served in part to indicate the direction of the present investigation. In general, the evidence to date appears to point to the tentative conclusion that at its onset stuttering is different from the disorder into which it usually develops. In fact, the studies and opinions so far published indicate that *on the date of original diagnosis*, stuttering children may speak in a manner that is not always to be clearly differentiated from that of other children of like age who have not been diagnosed as stutterers.

The present investigation is designed to yield more definite information as to the characteristics of stuttering at its onset, and to explore the problem of the changes that occur as stuttering develops through its early stages into its more advanced phases. It is also designed to throw some light on the problems surrounding the disappearance of stuttering. Several of our cases had regained normal speech by the end of the investigation. We are also concerned with the conditions surrounding the onset, the aggravation, the alleviation and the disappearance of the disorder. Moreover, we are interested in obtaining more adequate information concerning children who develop stuttering and the characteristics which differentiate them from children who do not stutter.

Two groups of subjects were investigated, 46 stuttering children and 46 non-stuttering children. In the stuttering group there were 32 males and 14 females; in the non-stuttering group there were 33 males and 13 females. At time of first interview, the stutterers ranged in age from approximately 2 years, 3 months to 9 years, 3 months with a median of 4 years, 2 months. The non-stutterers ranged in age from approximately

[1]This study was carried out with the collaboration and assistance of Drs. Charles Van Riper, Dorothy Davis, Hartwell Scarbrough, Yuba Hunsley, Frank Bakes, Lee Edward Travis, Miss Susan Dwyer and several others who were serving during the course of the study as assistants in connection with the speech pathology program at the University of Iowa. Three M. D.'s, Drs. Edward Lee Russell, Santa Ana, California; H. F. Shirley, University of Iowa Psychopathic Hospital; and M. L. Floyd, Department of Pediatrics of the University of Iowa Children's Hospital, assisted with special examinations. Special funds were provided by the Laura Spelman-Rockefeller Foundation through the Iowa Child Welfare Research Station. Dr. George D. Stoddard, Director of the Iowa Child Welfare Research Station, and Dr. Lee Edward Travis, then of the University of Iowa, authorized and supported the investigation. A detailed report of the study is scheduled to be published by the Iowa Child Welfare Research Station.

2 years, 3 months to 9 years, 10 months with a median of 4 years, 5 months. The stutterers' I. Q.'s ranged from 80 to 159 with a median of 114. The non-stutterers' I. Q.'s ranged from 95 to 158 with a median of 116. The non-stutterers were drawn from the University of Iowa Preschools and Elementary School. In general, the socio-economic status of this group is probably slightly higher than that of the stuttering group. About one-fourth of the stutterers were attending or had attended the University Preschool.

The original diagnosis of stuttering was never made by the investigators. In three-fourths of the cases the original diagnoses of stuttering were made by the parents, and in the other cases they were made by teachers or relatives of the children. Only those children were placed in the stuttering group who were referred to the investigators as stutterers; the referral was accompanied in every case by a request for remedial advice and help. A child was accepted as a non-stutterer only if parents, teachers and others associated with the child—and the child—regarded him unquestionably as a non-stutterer. If anyone at all regarded a given child as a stutterer, that child was excluded from the non-stuttering group.

II. PROCEDURE

In setting up the procedure, several special considerations were emphasized. Since interview and case study techniques were clearly indicated, special care was taken to minimize the usual shortcomings of such techniques. First, an attempt was made to obtain cases in whom stuttering was of recent origin, in order that information might be obtained in relatively great detail concerning the onset of the disorder. The median interval between the date of onset and the date of the first interview was 5 months and 18 days. Second, a fairly long period of observation in each stuttering case studied was desirable. The median period of observation for these cases was 2 years and 4 months. Third, an attempt was made to check the information obtained by carrying out as many interviews as possible and by assigning two or more interviewers to each stuttering case. The number of interviews per stuttering case ranged from 2 to 19 with a median of 4 and the number of interviewers ranged from 2 to 5 with a median of 3. In the study as a whole, 17 different interviewers were involved; all held the M.A. degree in speech pathology or clinical psychology, and 13 now hold the Ph.D. degree. Every stutterer's home was visited by one or more interviewers. The 46 non-stuttering children were investigated by a single interviewer, and only one interview was made in each case. All interviewing was done in the homes, and the information supplied by the parents and by means in of the interviewers' observations was supplemented by data from the files of the Iowa Child Welfare Research Station.

III. RESULTS

Comparative data for the stutterers and non-stutterers were obtained with regard to birth conditions, general developmental conditions, speech development, diseases and injuries, stuttering and handedness in the family background and handedness and eyedness of the children themselves.

Every indication of a deviation from an entirely normal birth was noted in each case. A careful analysis of these data indicated that the two groups were essentially similar. The one case in whom birth injury was quite definitely serious was that of a stutterer who, however, was no longer stuttering at the close of the present study.

With regard to the age of "standing alone without support," walking, creeping, sitting and teething, the two groups presented almost exactly the same median and quartile values. Data on feeding and dressing self and bladder and bowel control revealed slight developmental differences in favor of the non-stutterers, which seemed to be most adequately accounted for by the fact that the Iowa City parents of the non-stutterers were all in active contact with the Iowa Child Welfare Research Station and its child study program for parents. At least, the other developmental data would hardly support an interpretation in terms of generally retarded development on the part of the stutterers.

The median and quartile values for the ages at which words and sentences, respectively, were first spoken are exactly the same for both groups.

A few more diseases and injuries were reported for the stuttering group. This was to be expected, of course, since the diseases and injuries experienced by the stutterers during the course of the investigation were included in their totals. This means that their illness and injury records covered about 2.5 years more, on the average, than did those of the non-stutterers. No one type of disease was reported by as many as half of either group. There was a higher incidence of tonsilitis and ear infections among the non-stutterers and a higher incidence of whooping cough, measles and influenza among the stutterers. However, examination of the individual case records reveals that in no case was either whooping cough or influenza even fairly closely associated temporally with the onset of stuttering. In fact, in only four cases could any kind of disease condition be mentioned among the factors possibly associated with onset of stuttering; these included one case of "very mild measles," one case of infected tonsils, one case of a cold and sore throat and one case who was thought to have been weakened by pneumonia some time before stuttering began. In each of these cases, however, there was no unmistakable relation between these conditions and the onset of stuttering, and in each case a number of other factors were also temporally associated with the stuttering onset. It is to be concluded that in no case did illness stand out as the only precipitating factor or even as an undoubtedly definite one.

"Significant" injuries were reported for only four non-stutterers and six stutterers, and none of these injuries had left any permanent effects of serious degree. No injury was temporally related to the onset of stuttering. Insofar as there might be a difference between the two groups so far as the incidence of illnesses and injuries is concerned, its significance in relation to the stuttering would appear to lie necessarily in the possible general effects of the illnesses since they were not found to be temporally related in any significant degree to the onset of stuttering.

Data concerning stuttering in the family background showed that for the stutterers one father and two mothers were stutterers and four

fathers and three mothers were former stutterers; for the non-stutterers, two fathers were stutterers and one mother was a former stutterer. Fifteen stutterers and four non-stutterers each had one or more stuttering relatives. Of the 56 speaking siblings of the stutterers, 9 were stutterers and 3 were former stutterers; of the 32 speaking siblings of the non-stutterers, only 1 was reported as a stutterer. Thus, there are more stutterers in the families of the stutterers than in the families of the non-stutterers. Any attempt to interpret this difference must involve a consideration not only of possible hereditary factors but also of family patterns of evaluation.

The parents of the two groups did not differ appreciably as far as handedness was concerned, nor did the siblings of the two groups differ appreciably in this respect. However, 15 of the stutterers and 4 of the non-stutterers had left-handed relatives outside of the immediate family. Handedness and eyedness data concerning the two groups of children were obtained. Judgments of handedness and of changes of handedness were based on detailed interview data and on systematic and casual observation by the examiners. A hand usage questionnaire was filled out for all of the non-stutterers and for 36 of the stutterers. These data were treated with special care because of the controversial nature of the issues involved. The data are summarized in Table I. This table indicates that there is practically no difference between the two groups with respect to eyedness or handedness. It is of special interest that 12 stutterers and 14 non-stutterers were judged to have had their handedness changed. Most of the changes were from a condition of ambidexterity to right-handedness. Two stutterers and one non-stutterer had been changed from left to right-handedness, and two children from each group had been changed from left-handedness to ambidexterity. Space does not permit a detailed discussion of the procedures used and the principles of intrepretation of the data. It can only be said here that the most defensible conclusion appears to be that our two groups of subjects do not differ to any theoretically significant degree with respect to early handedness, handedness at time of interview or handedness changes.

TABLE I
HANDEDNESS AND EYEDNESS CONDITIONS OF THE 46 STUTTERERS AND 46 NON-STUTTERERS

	Stutterers	Non-stutterers
No. right-handed present)	36	36
No. left-handed (present)	6	4
No. ambidextrous (present)	4	6
No. originally right-handed	26	24
No. originally left-handed	10	8
No. originally ambidextrous	10	14
No. changed handedness	12	14
Left to right	2	1
Left to ambidextrous	2	2
Ambidextrous to right	8	11
No. right-eyed	22	26
No. left-eyed	16	10
No. amphiocular	0	5

In summarizing all of the comparative data, it is to be pointed out that the similarities between the two groups of subjects appear to be much more significant than the differences. These comparative data do not seem to offer any definite bases on which one might account for the speech condition of the stuttering group.

An attempt was made to obtain detailed information concerning the speech phenomena that were originally diagnosed as stuttering in each case. In over 90 per cent of the cases it was possible to obtain quite adequate descriptive accounts, for in a few cases the parents were unable to recall specific incidents sufficiently to furnish a thoroughly reliable description of the very first phenomena which they had regarded as stuttering. For purposes of this summary report, in which it is not possible to give a full account of the clarifying details, it is sufficient to say that in approximately 92 per cent of the cases the first phenomena that were diagnosed as stuttering were beyond doubt essentially effortless repetitions of words, phrases or the first sounds or syllables of words. In the other cases also, these phenomena were, so far as could be determined, the predominating features, although there is some question as to whether, in these cases, diagnoses of stuttering were made before the child had begun to exhibit some degree of hypertonicity in connection with the repetitions or before the child had begun to exhibit such other reactions as prolongations of sounds, conspicuous pauses, etc. It can definitely be said that the characteristic phenomena originally diagnosed as stuttering in these cases were those involving simple repetition apparently without noticeable strain or tension and apparently without any awareness on the part of the child either that he was repeating or that the repetitions constituted a difficulty or abnormality.

The reactions involving hypertonicity, facial grimaces, holding of the breath, definite blocking and overt evidence of the child's awareness of difficulty, overt manifestations of embarrassment, annoyances, etc., and apparent devices and attempts to postpone or avoid speech—these reactions, with very few if any exceptions, appeared after the diagnosis had been made. The most reasonable conclusion appears to be that they were consequences of the diagnosis in the sense that the making of a diagnosis appeared to be part of a general parental policy. In turn, it appeared to intensify the parental policy in the direction of increased anxiety and vigilance. We are all familiar with the principle that the way in which one classifies a person largely determines one's general reactions to that person. This principle seems to have operated in these cases in which the parents classified their children as stutterers and then proceeded to react to them largely in terms of the implications of the label. These reactions on the part of parents were not confined to inner states of tension and anxiety or chagrin, but usually also involved overt attempts to influence the child's speech behavior and definite communication to the child of the parental evaluations of his speech.

An example will help to illustrate how this process works out in practice. The father of a three-year-old boy happened to notice one evening that the boy repeated a number of sounds or words. He reported later that there was no apparent tension or self-consciousness involved in the child's behavior and that until that time he had assumed

that the child's speech was entirely normal. For some reason, however, he regarded these repetitions as stuttering, and the next day he consulted the family physician. He was advised to instruct the boy to take a deep breath before speaking. Within approximately 48 hours after the boy had received this instruction, he had developed an apparent habit of frequent and serious gasping reactions which the father interterpreted as constituting a marked increase in the severity of stuttering. This is a particularly clear-cut example which, however, illustrates the fundamental principle by which one is able to explain in large part the transition from the simple repetitions to the more complicated phenomena which developed following diagnosis in these stuttering children. It is to be noted further that the simple repetitions originally diagnosed as stuttering were found in the speech of the non-stuttering children, where they had not been so diagnosed, and they have been reported by Davis (2) as more or less characteristic of the speech of young children, generally. The question as to why such phenomena are diagnosed as stuttering by some parents and not by others deserves further intensive investigation. There can be little question of the fact that highly similar varieties of speech in young children are thus differently evaluated by different parents, and there can be little question that the way in which they are evaluated plays a determining role in the subsequent speech development of the child. In the present study, there were some striking examples of the diagnosis of stuttering being applied to speech that was undoubtedly quite normal with very serious results.

More highly quantifying procedures would be necessary in order to settle the question as to whether those children who come to be diagnosed as stutterers actually do exhibit a higher frequency of repetitions or of other evidences of non-fluency than do other children before they are diagnosed. Some of them certainly do not. When it is true that they do, they serve to raise the question as to the conditions under which simple repetition would give way to more serious reactions in the absence of a diagnosis of stuttering. From the study by Davis (2) and from the present study, it is obvious that children generally tend to repeat more often in some situations and in certain types of speaking than in others. In homes characterized by conditions particularly conducive to repetition, one would expect children to show more of it and such children might more readily come to be regarded as defective in speech and so suffer the further speech interference consequent to such an evaluation. In some of the homes involved in this study, such conditions appeared to be significantly in evidence, but this was true in varying degrees of the homes for both groups of children. In general, the sheer frequency of speech repetitions did not appear to be as significant as the evaluations placed upon them by the parents.

The severity of stuttering during the course of the disorder in our 46 children was judged by the examiners to be mild in 12 cases, average in 28 and severe in 6. By the end of the study, 25 were judged to be definitely normal, 5 nearly normal, 3 indefinite, 1 mild, 11 average and 1 severe. Thus only 13 out of the 46 were still unquestionably or to any significant degree stuttering when the investigation was closed. In the course of its reduction in severity and disappearance, the stutter-

ing changed not only with respect to the frequency of its occurrence, but also with respect to the degree of hypertonicity and affectivity involved. In general, it went as it came in that it receded from a complicated strenuous pattern to one of simple effortless repetition. In the majority of cases, the only remedial advice offered the parents was that designed to reverse their evaluations of the child's speech and to insure his being stimulated and responded to on the assumption that he was a normal child capable of normal speech accomplishments. In other words, the diagnoses were challenged and reversed. In some cases, specific recommendations were made with regard to the alteration of certain home and school conditions which seemed to be particularly conducive to non-fluency. In a few cases handedness changes were recommended and some of these were carried out reasonably well while others were not. In very few instances was any attention given directly to the child by way of exercises or drills or even discussion of the problem.

IV. CONCLUSION

This study of the onset and development of stuttering in young children suggests the advisability of intensive investigation of the apparent probability that stuttering in its serious forms develops after the diagnosis rather than before and is a consequence of the diagnosis. While in no way disregarding the importance of other possible factors, this conclusion is intended to focus attention upon a factor that seems to be highly significant and that appears to have been disregarded in previous theoretical approaches to the problem of stuttering.

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A STUDY OF THE INFLUENCE OF COMMUNICATIVE RESPONSIBILITY IN A CHORAL SPEECH SITUATION FOR STUTTERERS

By
JON EISENSON, PH.D.
CHARLOTTE WELLS, PH.D.

We have known for a long time that the speech performance of most stutterers is better in a choral situation than it is when the stutterer is required to perform alone. The purpose of this study is to determine the influence of communicative responsibility on the speech performance of stutterers in a choral speech situation. Will the superiority of performance be maintained when the element of responsibility to communicate, ordinarily absent in choral situations, is introduced?

The subjects of the experiment were nineteen male stutterers attending the speech clinics of the University of Wisconsin and Brooklyn College. The study was carried on from the summer of 1940 to the summer of 1941.

Each stutterer was asked to appear at the recording studio at a specified time. No explanation was given to him, since all the subjects were receiving clinical assistance at the time of the study. The clinician working with the stutterers usually made the arrangements and the appointment coincided with one of the regular clinic meetings.

The clinician asked the stutterer to come to the room in which the experiment was conducted to assist in a study being made. The experimenter met the subject and the clinician at the door of the room and gave the following instructions:

> "We should like to have you read this selection. In order to facilitate your reading, your clinician will read aloud with you. You may look the selection over before you begin."

It was made clear to the subject that the first reading was a rehearsal only, and that no one was listening to him, although, for the purpose of practice, he was to read in front of a microphone. The clinician read with the subject in both situations, so that the choral aspect of the stutterer's speech performance remained constant.

After the subject had read through the passage to become familiar with it, he was placed in front of the microphone with the clinician standing on the "dead" side of the microphone so that his voice would reach the subject but would not dominate in the recording. The recording engineer in the control room made all necessary arrangements, but remained out of sight. The subject was not told that a recording was being made, but considered the reading of the first passage a practice period with no need for communication to an audience of listeners.

When the first passage had been read and recorded, the following instructions were given to the subject:

> "This is an experiment to see how well stutterers read in a radio situation. You will read into the microphone and your

> voice will be sent to another room in which a group of students are present. As a test of your reading ability, the students will be required to answer a number of questions, based on the selection. To help you with your reading, your clinician will read the selection aloud with you. We will give you the 'all ready' signal. You will then be 'on the air' and you will begin your reading. You may look over the selection before you begin."

The subject was then placed again in front of the microphone. The clinician took the place he had occupied previously. The experimenter went out of the room, presumably to check the readiness of the listening group and returned to say that all arrangements were completed. The second passage was then read and recorded.

The subject was thanked for reading and went with the clinician to resume the clinic meeting which had been interrupted for the experiment.

The reading material was taken from one of the University of Chicago Round Table discussions. Both passages were from the same speaker's discussion. The two passages were equal in length, varied but .14 on the Gray and Leary index of difficulty, and were interchanged during the experiment, fourteen subjects reading the one passage first and the other five reading the alternate passage first. In all cases, the two situations were kept in the same order. In the first, no communication was necessary; in the other, communication with an unseen audience was called for.

The following are sample sentences from each of the passages used:

> "Now the simple fact is that capital will not go into business and people will not venture . . . The first thing to do is to get a sensible fiscal policy and lower taxes . . . We know that the lower you make the rates, the bigger the income . . . "

> "Let me say that the answer to that is not to reverse the process and throw the favoritism on the other side. . . The thing the American people are more interested in than anything else is economic security . . . That . . . has been the policy of the New Deal administration."

The recordings were played back on a turntable of speed similar to that of the recording turntable. The blocks, repetitions, omissions, and substitutions were counted in each recording. The errors for each subject in each situation are given in Table I.

Of the nineteen male subjects forming our group, eight made more errors in the "communication" situation, situation II in the table. This increase varied from 2 to 29, with an average increase of 6.4 errors. The seven subjects who decreased the number of errors in the second situation varied from a decrease of 1 to a decrease of 12, with an average decrease of 3.7 errors. Four of the nineteen subjects made no change in the number of errors in the two situations, their average of 3.7 errors remaining constant.

TABLE I

Sub.	Sit.	B	R	O	S	T	D	%
A	I	6	2	0	0	8		
	II	12	1	0	0	13	5	63
B	I	1	1	0	1	3		
	II	0	0	0	0	0	–3	—
C	I	3	0	2	0	5		
	II	4	0	1	0	5	0	0
D	I	4	12	0	0	16		
	II	2	8	1	0	11	–5	–31
E	I	1	0	0	2	3		
	II	0	2	1	0	3	0	0
F	I	9	1	0	0	10		
	II	7	7	1	1	16	6	60
G	I	5	2	0	0	7		
	II	1	3	0	1	5	–2	–28
H	I	1	1	0	0	2		
	II	1	0	0	0	1	–1	–50
I	I	0	0	0	0	0		
	II	2	1	0	0	3	3	—
J	I	0	0	0	0	0		
	II	2	2	0	0	4	4	—
K	I	2	0	1	0	3		
	II	1	0	2	0	3	0	0
M	I	0	0	1	0	1		
	II	6	1	0	0	7	6	600
O	I	16	2	0	1	19		
	II	30	18	0	0	48	29	150
Q	I	2	1	1	0	4		
	II	0	3	1	0	4	0	0
R	I	1	4	0	2	7		
	II	6	0	0	3	9	2	28
S	I	2	2	0	3	7		
	II	3	0	0	2	5	–2	–28
T	I	1	2	2	2	7		
	II	2	2	4	2	10	3	43
U	I	9	3	4	1	17		
	II	3	0	0	2	5	–12	–70

TABLE I—(Continued)

Sub.	Sit.	B	R	O	S	T	D	%
V	I	2	3	1	1	7		
	II	3	2	1	0	6	–1	–14
Tot.	I	65	36	12	13	126		
	II	85	50	12	11	158	32	723
Av.	I	3.4	2.0	.6	.6	6.6		
	II	4.5	2.6	.6	.6	8.3	1.6	60.2

KEY—Sub.—Subject. Sit.—Situation (I, no respsibility for communication; II, responsible for communicating.) B—Number of blocks; R—Number of repetitions; O—Number of omissions; S—number of substitutions; D—Difference in number of errors, Sit. II - Sit. I. % of increase in errors shown. T—Total.

The percentage of increase in errors varied in these nineteen subjects from –70% to 600%, with an average increase in errors of 60.2% for those whose scores could be used for computing percentage. Three subjects who made no errors in one situation of the two, and four subjects whose number of errors did not vary, were excluded from the computations of percentage.

Results and Discussion

The stutterers as a group showed a decrease in the quality of their speech performance—as measured by the number of errors, blocks, repetitions, omissions, and substitutions—when the element of communicative responsibility was introduced in a choral speech situation. The decrease in quality of performance was not great enough to be considered statistically reliable. Considerable variation was found within the group of stutterers. Some stutterers showed no change in the quality of their performances, and others actually improved when responsibility for communication was introduced.

It seems important to the present experimenters that about half of a group of nineteen stutterers showed a decrease in quality of speech performance in a choral reading situation. We believe the decrease to be a result of the influence of the introduced element of required communication. We believe, further, that the results of the experiment indicate a likelihood that the stutterer's usual superiority of speech performance in choral situations can be explained by the lack of communicative responsibility generally characteristic of such situations.

SECTION ON OPINIONS, HYPOTHESES, THERAPIES AND CASE HISTORIES

This section is devoted to articles which present ideas and mere opinions not supported by objective evidence. Also to suggestions or outlined methods of treatment and to case histories. The *Journal of Speech Disorders* prefers articles accompanied by sound scientific experiments and proof.

No reprints are furnished to authors of articles in this section.—THE EDITOR.

A WORKING HYPOTHESIS AS TO THE NATURE AND TREATMENT OF STUTTERING[1]

JULIAN B. ROTTER
Indiana University

From a previous experimental study (6), the author inferred a relationship between those environmental factors which are commonly called "pampering," and the occurrence of stuttering. If such factors play any etiological role in stuttering, this earlier study did not demonstrate in what manner they operate. In order to discover this, the history prior to stuttering and the development of the stuttering reaction were examined extensively in eight adults. During the process of taking these histories, an hypothesis became sufficiently well formulated that a therapeutic approach which it indicated was undertaken on five of the cases as a partial test of its validity. The history-taking and the therapy were carried out under somewhat controlled conditions as described below.

SUBJECTS AND PROCEDURE

The main criterion used in selecting the cases was the possibility of finding sufficient time when both the investigator and the case could meet conveniently. The general personality adjustment of the cases, as externally observed, and the severity of their stuttering covered a wide range. They were all of average or superior intelligence, in terms of Otis mental test scores. All but one (Case 2) had been subject to some previous form of therapy.

In the recording of histories, until a fairly complete and coherent picture was obtained, the investigator refrained from any active inter-

[1]The previous investigation (6) and the case work on which this article is partially based, were done at The State University of Iowa, 1937-38, under the general direction of Drs. Lee E. Travis and Wendell Johnson.

pretation or suggestion that might color the information given. However, it should be admitted that the nature of the questions tended to bring out certain kinds of information, although the material obtained, which is summarized below in the case histories, must be regarded as factual.

The sources of information were as follows: (1) Direct questioning in regard to past events and attitudes; that is, with the emphasis placed on actual events and on variations in speech in differing daily situations as well as variations over the entire ontogenetic development. (2) The subjects, parents, and in some cases, teachers, were asked to write directly to the investigator, describing their version of the circumstances preceding and during the onset of stuttering. (3) Before the subject could possibly discover any theoretical bias on the part of the investigator he was asked to write out in detail all of his earliest memories.[1] (4) The subject was asked to list in detail situations, goals, etc., (a) where he felt stuttering was a handicap; (b) where it made little or no difference; and (c) where it actually was of some help. They were also asked to list the situations which they feared the most from the speech viewpoint. (5) After the subject was well along in therapy, he was asked to write an autobiography, which in some cases produced additional facts.

The eight case histories given below are obviously not complete and are concerned almost wholly with psychological conditions. Information concerning organic states and ordinary civil facts, not given in these summarized histories, was taken in detail but was not included here in order to conserve space, unless it was clear to the author that it had some important bearing on the development and course of the stuttering. At the conclusion of each history the interpretations of the author, based on his own evaluation of the case material, are presented. Once treatment was begun, the subjects dropped all other therapeutic approaches, either directed by someone else or being carried on by themselves. A detailed description of the therapeutic procedure will be given later.

CASE HISTORIES

Case 1, Robert

Age 21, male, medium height, good-looking, meticulous dresser, agreeable and friendly. Family well off for the small midwestern community where he spent his childhood. Junior in college.

An only child, he described his childhood as being "doubly pampered." A younger sister of his mother's lived with the family and he reports that both mother and aunt would fight for the privilege of dressing him and taking him downtown. He slept with his mother usually and with his aunt when he did not sleep with his mother, at least to the age of six. Usually he preferred to play alone and liked being with adults. His earliest memory was of having his hair cut for the first time while his mother and aunt cried. He went to kindergarten where his aunt was the teacher and from there to the first grade. Before he pro-

[1] A discussion of the significance and interpretation of such earliest memories is given by Adler (1).

gressed very far he was taken out of school and taught at home (both his mother and aunt were school teachers) during the first year and subsequently in the second, third, fifth, and one later grade. In high school he received average grades. His choice of college was determined mainly by the presence of the speech clinic at Iowa and he began work on his speech immediately upon entering.

Speech History

Before entering the first grade he was forewarned that his teacher was a "holy terror" and he entered this class already fearing the situation. He states, "I was in constant fear of her. After about a month she slapped me when I did something wrong. What I did right then is rather vague, but I know that I thought I'd die on the spot." Shortly after this his mother visited the school and she describes the following episode, "Robert talked very low and faltered several times. Not knowing what the trouble was I took him to the family doctor and he advised taking him out of school immediately as he was in a nervous condition." Of this year home, Robert states that outside of the fact that he stopped stuttering he remembers very little. The second year when back in school he began to stutter again, but his teacher was very kind to him. On a day when the teacher was absent a substitute teacher who was not acquainted with his "malady," called upon him to read. The mother reports, "When Robert read she thought it was funny, so for her own amusement she had him read on. When he arrived home for lunch he showed the reaction; he looked like he had all the life taken out of him." Consequently, he was taken out of school again, and again when home he did not stutter. This procedure was continued in three later grades. In high school and grade school his mother would go to school before the beginning of each semester to register for him and to see all his teachers, the principal and advisors, to tell them that Robert needed special attention and care and should not be called on in class.

One summer during high school he was taken to New York for treatment of his stuttering, the therapy showing little effect. During vacations his speech always improved. At the Iowa Speech Clinic he was subject to several therapies resulting in a dimunition of the severity of the stuttering, but no actual cure. On one summer vacation during this period he stopped stuttering while at a job consisting mainly of reading numbers in an accountant's office.

At the time of the first interview he was thoroughly convinced of the seriousness of his "handicap." He reported that on vacations, on dates, and when talking to inferiors, he had less trouble than usual. His appearance was practically faultless, he was an active member of one of the leading social fraternities on the campus and was quite interested in "dates." He played tennis well but reported that when he started to lose he would begin obviously to "fool around" so that he could give the impression that he was not trying. In general, he reported that he didn't mind discussing his stuttering with people, in fact, he rather enjoyed it. Listing situations where stuttering helped him, he gave a long list of items which is reproduced without change of words or punctuation. The obvious breaking away from the instructions on the fourth

item and the unasked for parenthetic rationalizations are of decided interest. (1) It gave me a topic of conversation in certain situations. (2) In getting out of much school work (reason for low grades). (3) Getting sympathy from everyone and being able to feel sorry for myself. (4) Reason for not getting more dates and not being more popular (generally). (5) Making my family feel that they must do everything in the world for me. (6) Making me enjoy little things more than most people (scenery, weather, music, shows, reading, etc.). Living in general. (7) Making me try and do everything well (not excell). (8) Interest in knowing people and understanding them. (9) Being the center of attention.

Interpretation

It is quite clear in this case that the first stuttering appeared when called upon in class at the time when the mother came to observe him. The excessively pampered child, in the classroom which in comparison to home he felt was very hostile and with a teacher who had struck him, was probably overwhelmed with self-pity, accentuated by the appearance of the beloved protector, his mother. Being in this high state of emotionality, when called upon, he faltered and could not speak. This brought the wonderful result of being permanently removed from the feared school and returned entirely to the loving and ever-protecting atmosphere of the home. When returned to school the following year the faltering reappeared, although it was absent all the time at home. Before this second year had gone very far he was able again to return to his mother's protection by means of his stuttering and several times subsequently. From a study of the adult personality, it is quite evident that the stuttering had taken on at least two new meanings. One was an excuse for lack of achievement, the second as a device for getting attention and sympathy from society as a whole.

Case 2, John

Age 27, male, tall, presentable-looking, athletic. Home in a small midwestern town. Family of adequate socio-economic status.

The oldest child in the family, he was three years old when his younger brother was born. At about this time a young aunt came to live with them who, with her girls friends, showered much attention on him. They often dressed him up as a girl, and upon entering school he had long, bobbed hair and wore immaculate velvet suits. When asked about his parents' preferences, he stated that his father was always away from home, but he thought his mother liked him better than his brother. His brother throughout was the more successful, both in school and in social life, and when the case entered the clinic his brother was the editor of the town newspaper. His earliest memories were as follows: (1) Taking castor oil against his will . . . his father got down on the floor and poured it down his throat. (2) He was hard to manage at home. (3) He got a brand new bicycle, which was too big for him, so he traded it with another child who had a smaller one . . . remembers that he got a paddling and was sent to get his own back. He entered school when six years old and reports that he was afraid of other chil-

dren at this time, especially since they teased him as being a "sissy," but the teacher was very kind and thought he was the nicest boy in the class because he was always good and dressed very neatly and cleanly.

Until the fifth grade this situation persisted, with John more or less isolated from any playmates, but at this time he began to play with other children. For several years after, however, he considered that he could not play most games as well as the other boys and would give up. He maintained the shy, retiring nature from which he temporarily blossomed forth when his schoolmates began to dance and he already knew how. After awhile he began to feel that the other boys were better dancers than he, and he gave up dancing entirely. In high school he "gained back some of his confidence . . . tried out for basketball, but was no good because he was afraid to get in and play. He maintained that in practice he was a good shot but in a game he was too tense to shoot well. Later in high school his social relations and athletic achievements improved. Following this, he worked for several years at various jobs. He tried one year of college, quit, and worked for several more years. The final stimulus for his coming to the Iowa Speech Clinic was his failure to get a coveted job with a large oil company due, he claims, to his speech.

Speech History

His family and John guess that stuttering began around four or five, but he was not aware of any stuttering before he went to school. He was excused from recitations from the beginning. When he did speak, he reports that teachers and parents tried to slow him down so that he wouldn't stutter. He received good grades throughout school. In learning poetry he would get up and recite a poem without stuttering, if he knew it; if he didn't, he would get up and block and shift until the teacher would excuse him and credit him with a perfect recitation.

In high school he hardly ever had any trouble in arithmetic classes, a subject he liked and in which he was proficient, but in other classes he was always afraid to talk "for fear he would stutter." In the last two years, when his social relations and athletic achievements were better than ever before, he had very little trouble with his speech. Throughout all this time he had more trouble at home than anywhere else. During the following years the stuttering persisted but varied considerably, it being worst the year at college and otherwise occurred more or less in inverse relationship to the importance of the position he had. Even when his stuttering in business relations was practically gone, it persisted strongly at home and in social situations.

John, at the time of entering the clinic, was an extremely extroverted and friendly person. He manifested a great desire to do anything to cure his stuttering, which was moderately severe. His attitude was one of feeling sorry for himself, and he thought that everyone else should feel sorry for him, too. He listed situations in which stuttering had helped him as: (1) Avoiding preparation of oral recitations and debates in school. (2) Having the teachers' sympathy. (3) Avoiding of running many errands. (4) Making him more kind to other people.

Interpretation

This is a picture of an oldest child surrounded by adults (parents, aunt, and aunt's friends) who was unused to competition with other children as evidenced by his fear and dislike for them when entering school. His early home behavior after the birth of his brother suggests a marked reaction to it. In his listing of things where stuttering helped him he includes an apparently insignificant point, namely, that he got out of running errands. Perhaps we can restate this to say that "my brother had to run all the errands for me." The constant severity of the stuttering at home, where he got the most sympathy, also argues for the importance of this early home situation in the developing of the stuttering. Unfortunately the exact circumstances of his beginning stuttering are lost, but it is definitely significant that he was not aware of any stuttering until he first had to make the difficult adjustment from an over-protected home life to the open competition of the school room. The importance of his tendency to give up an activity as soon as competition became great must also be noted (i.e. dancing). Finally, it appears that the constant fluctuation of the severity of his stuttering follows a clearly defined psychological pattern but no physiological one that could be determined.

Case 3, Richard

Age 25, male, presentable, friendly. Childhood spent in midwestern city where his father was a school teacher. Graduate student in business administration.

An only child, he was of normal weight at birth, but was bottle-fed from the first. He soon became a feeding problem and lost weight rapidly and had, according to his mother's report, at least two convulsions before he was three months old. At fifteen months he had whooping cough, at two years diptheria of the larynx. He recovered from all these illnesses and was according to description a healthy normal boy at three years. Much of these first three years were spent in long visits to his grandmother as his mother was very sick. During one of these visits a sister was born who lived only a very short time. Doctor's bills made deep inroads into the family finances and the general air of the period of his early childhood was one of fear and anxiety. His earliest memories concern situations where he was rescued from leaning over the railing of their second-story flat by his anxious mother. He remembers leaning over deliberately and waiting for his mother to come and find him thus. Another memory is of falling off an ironing board when his mother was gone from the room. There are also a long series of very vivid early memories of times when he was terrified . . . by an idiot . . . by a man dressed as a rooster at a church Hallowe'en party, etc. His father was a very dominant person who, from early childhood to adulthood, made all of Richard's decisions. He was afraid to start going to school and also to change from one class to another. In his autobiography he writes, "During grade school days we moved three times, necessitating a new adjustment to school situations each time. These changes were always very difficult in my case and make up some of the most trying situations of my life." The vacation following com-

pletion of grammar school was marked throughout by anxiety concerning his having to go to high school. At this time he stopped playing with companions his own age and played games with children considerably younger than himself. This lasted for the first two years of high school and was given up under considerable pressure from his parents. Clarinet playing was substituted for this. After school, instead of playing with classmates, he went home and practiced the clarinet. Following in turn were amateur radio and other hobbies that took up all of his waking hours outside of school. About this time he was also burdened with facial acne. Upon finishing high school his main personality characteristics were introversion, fear of new situations, shyness and timidity. He was physically small.

Richard started college as an engineering student. His first year was marked by social, physical and academic failure. He was living at home during this first year but the second year, under pressure from his father, he went to a school at some distance from home for the training of commercial teachers. Of his arrival at this school he writes, "I found a funny thing happened almost at once; when my parents drove away that afternoon it seemed as though some of the load under which I struggled went away with them. I felt better immediately . . . I never had a homesick hour all the rest of the time I was there." He soon became fast friends with someone rooming in the same house whom he characterizes as slow, easy going, and happy go lucky. This friendship is still very important to him. Under encouragement from this friend he learned to play tennis and make the college tennis team; he learned to dance and go out on dates and to parties and was pledged in one of the social fraternities. Upon graduation from this school he was placed through the college placement bureau and taught for two years in a small school. He then decided to get a better job and went to summer school at Iowa, but found that he couldn't get a job and stayed on to complete the work for an M.A. degree.

Speech History

He did not start to stutter until between the ages of four and five years. At this time he was not considered as a stutterer by his parents. He himself was the first one to apply the name stuttering to his speech. After a dinner at home, at which there were guests present, his mother asked him why he didn't say please at one particular occasion and he replied that he was afraid that he would stutter. His speech difficulty became worse when he entered school and always improved during vacations. However, during the vacation preceding his going to high school, which was marked with anxiety over the new, difficult adjustment he anticipated, there was no improvement. He received speech correction work in high school with no effect. When he was engaged in amateur radio work he conversed fluently with other invisible amateurs. The severity of his speech difficulty lessened somewhat in college, but he feared that he couldn't get a job on graduation because of his speech and neglected even to apply for one until his father came to school and applied for him. Once starting to teach, however, he reported that he stopped stuttering completely for the two years that he kept his posi-

tion. This was not a gradual but a sudden change. Once he gave up this job he began to stutter again and failed to get a position teaching at the conclusion of summer school due apparently to his speech.

At the time of the first interview his hesitations were short and not accompanied by facial contortions or distraction mechanisms. Under difficult situations, however, they became more pronounced and were marked by changes in voice quality. He never stuttered when speaking to his roommate, who was the same close friend he had in college. His manner at this time was very friendly and somewhat "nervous." In his listing of situations where stuttering was of advantage, he lists getting out of recitations, avoiding unpleasant situations, as an excuse for failure of any kind.

Interpretation

From the very beginning, this child's environment was one of anxiety. His earliest memory is one by which he demanded his mother's attention through appealing to her anxiety for his well being. He himself was filled with many fears. It is not speculating too far to think that as a result of his own fears he needed and constantly received protection from his parents. The emotional upsets that he was frequently being subject to may have well resulted in numerous speech interruptions until the fear of speech interruption became added to his many others. At this time he had an uncle who stuttered and whom he saw often. He learned the name and nature of his uncle's speech difficulty at an early age and also learned that it entitled its bearer to all kinds of special treatment and protection. In school, his father went to all of his teachers, as he entered each new grade, acquainting them with his child's handicap. Many new adjustments and difficult situations were avoided for he needed his father to precede him like a press agent before he would approach a new situation. In vacations when the demands of school were lessened his speech improved. In college when away from home for the first time and his stuttering could no longer bring him their protection, he made a good adjustment under the stimulation of an extroverted friend. When he was set up in a teaching position, which he obtained more or less in spite of himself, there was nothing to fear. He had a position of superiority which he could not lose as there was a severe shortage of teachers of commercial subjects and consequently no need of a defense mechanism. However, once he resigned this position and its security and faced an unknown future, his stuttering began again. What possibly arose as a method of getting increased protection seemed to become a way of anticipating new situations and expected failure by starting with an excuse first.

Case 4, Kenneth

Age 18, male, tall, athletic build, sad expression. Rural background (large western farm) of adequate socio-economic status. Freshman at college.

Kenneth is the youngest of three children, the only boy in the family. He is separated from his next older sister, who is described as being "nervous" and very difficult to get along with, by several years. The

parental discipline was one of over-protection plus threats. Early memories were concerned mainly with fears and several "scares." His early playmates before school and during the first few grades were mostly girls. Quite often he was teased and reacted severely to this teasing although he was unable to remember what he was teased about. In the first six grades at school he states he was definitely the teacher's favorite. In high school he received adequate grades and during this time was rather retiring, shy, sensitive and concerned over his own inadequacies. He was quite shy with girls and only rarely went out on "dates," or attended parties. Following high school he went to Iowa, mainly to work on his stuttering.

Speech History

His parents claim he stuttered from the beginning of speech. At four years of age, after he supposedly began stuttering, his handedness was shifted from left to right, the shift making no observable difference in speech. He himself has no memory of early stuttering and states he was not self-conscious concerning it before the age of ten. The father had "stuttered" before beginning school and it is reasonable to suppose, considering his over-protective and dominating attitude, that his attitude and concern over his son's speech was abnormal. At the age of ten, in the fourth grade, his teacher began to give considerable attention to his "speech handicap," taking it upon herself to excuse him from recitations, etc. He states that he remembers not wanting his teacher to overhear him talking to the boys on the playground because he did not stutter when talking to them. In the following grades the stuttering was not at all severe and recitations were not avoided until the eighth grade, in which he was placed after the sixth. Here he did not feel he could cope with the older boys, asked to be excused from an oral report and thereafter refused to recite before the class. In high school the "stuttering" manifested itself as a "sort of trembling in his voice." He asked his mother to speak to the teachers and principal so that they would not call on him and writes in his autobiography, "they were all wonderfully sympathetic." In the later years in high school he began to avoid a good many speech situations and became more and more introverted. His stuttering, however, in the main, was worse at home than in any other situation.

On arrival at the Iowa Speech Clinic, he seemed quite sorry for himself, although stating, without being asked, that he did not want sympathy. His handedness was shifted and the "bounce pattern"[1] attempted before taking up the present therapy. His stuttering was severe at this time, accompanied by many marked facial grimaces. He had made very few friends in his six months at Iowa and had little recreation. He listed ways that stuttering was a help as: getting out of recitations in class, getting attention and sympathy as a child, made me a favorite of the teacher, gave me a certain satisfaction because I was able to get out of things.

[1]The bounce pattern is a voluntary, easy, repetitive pattern substituted for the strained stuttering reactions which most adult stutterers present.

Interpretation

The over-protective and speech-conscious attitude of the parents appears to be responsible for the speech difficulty of this case which his parents, but not himself, were aware of as being abnormal. It was not until his fourth grade teacher reacted to it as if it were a handicap that he actually had difficulty in speaking and what could properly be called stuttering. Over-dominated and over-protected as a child, encouraged to fear most things, his goals in life centered around protection against the unknown, sympathy and attention. He found his speech able to bring him some of these at first, but on approaching adulthood they began to fail him among friends of his own age of both sexes so he withdrew from social activities but kept up his severe stuttering at home, where he could still find them. On coming to Iowa, the same needs of sympathy and protection were evident and stuttering was being used as an attempted method to attain them.

Case 5, Raymond

Age 20, male, short and slight build. Background of adequate socio-economic status in a small midwestern town. Sophomore at college.

Raymond was the older of two children and was the only child for a period of over five years, until a sister was born. During this early period he was not only the center of his parents' attention but also was given a great deal of attention by an uncle, aunt and two older girl cousins who lived next door. He spent considerable time with his mother, going everywhere with her, particularly to many church meetings. During this period he developed a very characteristic "stubbornness," insisting always on getting his way. He was also able to control playmates through his superior collection of toys. Almost immediately following the birth of his sister, four new behavior characteristics appeared. He had to have either his mother or father hold his hand or he could not fall alseep. He was bothered by nightmares, usually of being overpowered by some irresistible force. He would awaken often in the middle of the night and his legs would ache so that his mother would have to get out of bed and rub his legs until they stopped aching. He writes in his autobiography that an interesting thing about these aches was that they would often start in one leg or foot and change to the other leg or to another part of the same leg. He also began to stutter shortly after the birth of this sister. About the second grade he became very conscious and sensitive to his small size and began to compensate by aggressiveness, mainly on a verbal level, towards bigger boys and by strong attempts towards athletic achievement. It is significant that as a fielder in baseball he would carefully and consciously calculate where the batter might be expected to hit the ball and then move as far in the opposite direction as possible so that it should not look so bad when he missed the ball. He did well in school except in those classes where he would rebel when the teacher was domineering and very authoritative. In high school he was quite active in service and academic pursuits, particularly in the senior year, although somewhat inhibited socially. Following high school he went to Iowa to combine college and work on his speech.

Speech History

Hesitation in speech began somewhat after the birth of his younger sister. It apparently appeared along with a generalized emotional instability as shown in the other symptoms, mentioned above, that appeared at the same time. The displacement at home was almost immediately followed by the frustration of having to go to school and share the teacher's attention with twenty other pupils. He reports he was a good reader, but became very nervous waiting for the teacher to call on him and when his turn came his voice would break and he would have repetitions. At ten years he was brought to the Iowa Clinic and advised to change his handedness, but he resisted this treatment and, according to himself and his mother, it made him very nervous, almost hysterical, and his speech became considerably worse. During certain periods in high school, particularly the last year, and on one summer vacation his speech was very good. The first year at Iowa it was quite erratic with observable good and bad periods.

At the beginning of treatment he was somewhat hostile. His speech was still characterized by periods of fluency, but when stuttering his facial expression was one of effort and upset. He was beginning to go out with one girl rather steadily and within a short period reached a point where he never stuttered when with her. His listing of helps and handicaps of stuttering clearly demonstrated that his use of stuttering was to protect him against situations which he could not dominate. He reported that he felt "handicapped" by stuttering because he could not criticize or disagree with people or because he could not give directions, but the only aid that stuttering might have given him he listed as preventing him from "giving hell" to someone when he was angry.

Interpretation

It seems that when displaced by his younger sister, this child, already exhibiting marked signs of pampering and attention-getting mechanisms, showed a tremendous amount of insecurity as evidenced by his nightmares of being over-powered and the many mechanisms to maintain the parents' attention and love. It is not clear whether the "stuttering" first served the purpose of attention getting or only appeared at the frequent periods of emotional upset. It is clear that it soon became a method by which he excused himself for not always dominating everyone around him as he was accustomed to do before his sister was born and before going to school. In later periods this could be given up in situations where he was able to feel secure and maintain some position of dominance.

Case 6, Edward

Age 20, male, good appearance and pleasant manner. Southern city background of good socio-economic status. Junior at college, in school of business.

The second of four children, he maintained the position of youngest child for over four years until the third child was born. He was the favorite of his grandmother and favored by the mother because he was quiet and docile. His older brother was aggressive and made very good

grades in school, while the subject repeated the first grade in school because his mother thought his grade of C was "terrible." During his very early life as well as throughout his later life, he never demanded or achieved any independence and was always willing merely to do whatever he was told to do. One very early memory concerns an accident that befell him when taking his turn in some building project with other children; another concerns a disappointment due to the precedence of his older brother in some desired activity. Throughout school he was quite timid, but achieved some recognition due to his willingness to agree with everyone and his lack of aggressive reaction towards any kind of teasing. In high school he was quite active in a social fraternity. At Iowa his grades were mediocre and often quite poor. His main interest and sole source of satisfaction lay in his social fraternity life.

Speech History

His first "stuttering" experience was quite dramatic and clear-cut. He had no trouble with speech until the fourth grade, when the family moved and he was transferred to a new school with strange people and surroundings. When called upon to read he was simply unable to say anything due to emotional blocking. Succeeding reactions were similar and his mother went to school that semester to ask the teacher to refrain from calling on him because of his stuttering. This speech phenomenon, at first strictly localized to the classroom, began to appear in other situations, but was not too severe. He also recalls guilty feelings over speaking to the other boys around school without stuttering and fearing that the teacher would overhear him and no longer excuse him from class recitations. His subsequent history is one of not too severe stuttering but considerable worry and feeling of being handicapped. For a short period in college he had the experience of simply deciding one morning to stop stuttering and did stop for several weeks, but was unable to remember the incident that got him started again. He had tried various therapies at the Iowa Clinic his first two years without much change in his condition, and then gave up work on his speech. He stated he was unable even to imagine situations where his stuttering made no difference or was any help, but listed in long detail situations of past, present and future in which it was a handicap with the major emphasis on present social situations.

Interpretation

It appears that from preschool days on, this subject has set his goals around the desire for affection and the desire to avoid competition. Discouraged by the successes of his aggressive older brother, he chose to avoid attempting anything on his own rather than risk failure. His stuttering began as an emotional block to a difficult situation where he had already been impressed with his inadequacy. The recognition that this speech blocking could be used to escape the competition of school achievement was the stimulus for his continuing the reaction of speech blocking and its spread to other activities. In later years his effort for recognition of a social kind was not markedly disturbed by his slight stuttering and the stuttering served the purpose of accounting for any

failures or lack of achievement in "dating" or fraternity status. The problem of occupational adjustment after college was largely neglected through this feeling of being handicapped so that nothing could really be expected of him.

Case 7, Laila

Age 22, female, neat and pleasant-looking. Parents Norwegian of adequate socio-economic status. Sophomore in business school.

An only child, her preschool history is one of over-protection. Before entering school, "sensitiveness" and shyness were already well developed traits. Her playmates were always carefully selected. Throughout this preschool period she was allowed to play only with one little boy, as the other children were too boisterous. Most of the time she was content to play by herself. Another girl her age often came to visit at her house, but she remembers that she was afraid of this girl and would only play with her if her mother stayed in the same room. She could give no specific situational memories of this period. Her earliest memory was playing in the schoolyard with some girl who fell and hurt herself. When five, the family moved from a small South Dakota town to one in Minnesota, where her mother's family lived. During this year she had constant attention from a large number of aunts and uncles. She felt uneasy upon entering school despite the fact that she liked the things they did there. At this time she was six years old and could speak only Norwegian. However, other children in the class were similarly handicapped. Her history throughout elementary and high school was one of fair grades, sensitiveness, shyness and little contact with other children. From high school she went to the State University of Iowa, entered the business school, and made average grades.

Speech History

In the first grade, when entering school, she was faced with the double handicap of not speaking English and with a shift in handedness from left to right by her first grade teacher. However, up to this point and for the following year, she did not stutter. Her first memory of stuttering was in the third grade. She reports "the teacher was nice to me at the beginning, but when the children laughed at me when I recited in class, she did not seem so friendly to me." From then on she avoided reciting as much as possible. She had the most trouble when reading aloud. Once in the sixth grade, when reading orally, the teacher stopped her and said that she was doing fine and made her read on at length. She reports this as the only time she remembers reading without stuttering. Her mother and a teacher both state that they thought that the cause of the stuttering was feelings of inferiority and nervousness. In high school she wrote out all her oral reports, a practice started by one of her English teachers, of whom Laila says, "I felt at ease with her more than my other teachers because I knew she knew about my defect, and felt sorry for me." At all times she was very self-conscious concerning her stuttering and grew increasingly so throughout high school.

Upon going to the University she was away from home for the first time in her life and soon did not stutter at all in conversation or oral recitation, without any therapy being attempted. She did, however, still show clonic spasms when reading aloud in any social situation, and had been subject to therapy for this "stuttering." At the present time she had several friends at the dormitory where she stayed, due mostly to the aggressive extroverted nature of her roommate. When asked to list ways that stuttering was a help, she listed only under three separate heads things she could have done were it not for the fact that she stuttered and a great many situations she avoided. At no time did she show any "stuttering" in conversational speech. She still was markedly "sensitive" and blushed profusely.

Interpretation

The personality picture of withdrawal, shyness, sensitiveness, and fearfulness was well marked before entering school and was coupled with a history of over-protection and absence of any competition in her life. This lack of competition could well account for her uneasiness in entering school. When we add to this her language handicap and increased feelings of inferiority due to her change of handedness, we can see that the school situation might well have been emotionally disturbing. We can hypothesize that the emotionality and tenseness accompanying this oral recitation were so great at one specific situation when called on to read aloud, in the third grade, that her emotionality became evident in markedly disturbed speech. Hence the beginning of her stuttering. This probably served the purpose of avoiding these situations, which were looked upon as "tests" and in addition brought the sympathy of the teacher. Hence it flourished. In college, removed from the over-protecting home environment, finding dormitory life congenial due to her aggressive roommate, she had little use and need for the stuttering and she stopped it. She did, however, hang on to a last bit of it in oral reading, perhaps as if to keep it in case she should need it again.

Case 8, Helen

Age 26, female, awkward in appearance. At least average intelligence. Attending first year high school. Acts and dresses like a girl at least ten years younger. Background is marginal rural, parents poorly educated.

The youngest of ten children, she states that she was the favorite of the father until she was about twelve. From then on he no longer favored her. She stated that after this time he began to be rough to her. Her earliest memories, of which she reports a considerable number, going back as far as two and a half years, are almost all concerned with her sisters, particularly the two nearest her age with whom intense feelings of rivalry were still evident. Although it was difficult to get any precise notion of the home background, we know the family was Catholic and quite religious, and that two of her sisters have become nuns. She states that the sister nearest her in age dominated her as a child and made her feel inferior. In school she was always conscious of being awkward. She left school after finishing grammar grades and worked

on the farm. When about sixteen she exhibited a great deal of jealousy and aggression towards her next older sister and a niece of her own age who were being "taken out" by two brothers. When questioned about her sexual attitudes, she replied that if she stayed close to religion she would not be tempted sexually or in any other forms of sin. She had never gone out with a young man and stated that kissing was sinful. Around the home she had to work hard as all the older brothers and sisters were leaving. Helen claimed that she could not go to business school, or get married, because she had to take care of her parents, who were not very appreciative of her efforts.

Speech History

Helen states that she began to have trouble with her speech around the age of ten. However, this must be something of an afterthought, as nobody paid any attention to her speech as being different at this time, and she says that it was not at all prominent. About the age of fourteen it suddenly became more evident. This was at the same time that her sister and niece began to go out with the two brothers. At the end of that year she decided that the young man going out with her sister really loved her and not her sister, and that she could marry him except for the fact that she was a stutterer. At sixteen she noticed an advertisement for curing stuttering by correspondence. She took this course, spending large amounts of time "doing her lessons aloud," and at the same time her stuttering became much more severe. It continued to be severe until the age of twenty-five, when all of the brothers and sisters had left home and the parents were much too old to care whether Helen stuttered or not.

At this time she came to the Iowa Speech Clinic to be cured of the stuttering that had practically disappeared before she came. She decided to go back to school and entered the first year of high school. At first her contact with other stutterers and the clinic as a whole exaggerated her own stuttering, but after a short period she cleared up rapidly except for occasional blocks which, when they did occur, were very long and severe. She tried shifting handedness and later the bounce technique. When beginning conferences, her only blocks were rare, long, easy "bounces" which were accompanied by a smile and seeming enjoyment. When she thought that she was alone she usually talked to herself aloud. She stated that she had been doing this for the last few few years and that she also spent a great deal of time daydreaming. Her voice was high-pitched and sounded like that of a child of thirteen. She appeared to receive a great deal of satisfaction from working on her stuttering and followed all instructions and assignments slavishly. When asked to list the situations where stuttering was a handicap, she listed a series of words on which she "always" stuttered. She was asked to read them and did so without blocking on any of them. For ways that stuttering was of some help she gave a list of easy situations. When corrected as to the assignment she finally stated that, "It has given me a deeper insight into how other people feel when they are humiliated; also a deeper and kinder understanding of their sorrows and difficulties." After a few weeks of conferences, she was told casually that someone

who had heard her talk did not think that she was a stutterer. The following day when in "stutterers' class," she was called on to speak and said quite angrily and fluently, "I hear that there is a rumor that I have stopped stuttering and am no longer a stutterer and I would like to find out who the person is who started it because it certainly is not so." This fluent outburst was then followed by a very long bounce, accompanied with an expression of great pain.

Interpretation

This girl shows many neurotic signs entirely apart from any stuttering. Her complete isolation at the time of coming to Iowa, the excessive phantasies, the desire still to be a child and her consequent childlike behavior, her strong feelings of inferiority and her sexual inhibitions, are some of them. The stuttering arose just about the same time that her father no longer favored her but began to be rough towards her. It increased when competition with her sister and niece began to enter the heterosexual field and immediately became an excuse for her own lack of success in that field. The advertisement in the magazine convinced her even further that this was a good way to protect herself against a feeling of being a failure and she spent much time with her lessons, bringing the stuttering to everybody's attention as much as possible. When there was no longer anyone at home to impress with her handicap, the stuttering became less severe and she first decided to come to Iowa. Once at Iowa her speech became worse as she found a new group whom she could impress with her handicap, but improved rapidly as such behavior brought social approval. However, she would only improve so far and no further, possibly having no intention of ever giving up this mechanism unless an equally good one be substituted for it.

DISCUSSION OF CASE HISTORIES

In reviewing these case histories, certain common points present themselves. Perhaps the most striking of these is the wide variations in speech from severe stuttering to none at all. This is evident in both the ontogenetic and cross-sectional history of the individual. One stutterer may have blocks with one individual and not with another; one may always stutter when speaking over a phone, another never; one more at school and one more at home; and if we trace back into their history we are almost sure to find periods when they did not stutter at all or only very slightly, and periods when their stuttering was very severe. In fact, we might almost say that this variability is one of the most characteristic behavior reactions of stuttering and that the key to understanding stuttering as a whole, or the stuttering of any single stutterer, lies in understanding the nature and reasons for these variations. One thing immediately apparent in all these cases is that no physiological, "habitual," or heredity theory can rationally account for these variations in all eight of these subjects. What is also apparent, at least to the investigator, was that they did follow in every case clear-cut psychological lines which could account for both the long-term and immediate, daily variations. Such a psychological explanation was always in terms of the stutterers' goals and their feelings of adequacy or

inadequacy. To consider stuttering purely in terms of a fear response, either to speech itself or to social situations, is quite inadequate. In all cases in both the etiology and course of stuttering, the desires, needs, and all goals of the individual play an important role related to the fear and inadequacy.

A second outstanding similarity in these cases is that at the onset the stuttering always seemed to come from "without" rather than from "within." That is, the child never seemed merely to have something happen to his speech either gradually or suddenly due to some inner physiological condition, but what did occur was that some event or series of events changed his own attitude to the speech he had always had. None of these cases started to stutter without first discovering that interruptions in speech had some very definite effect on the people around them. One of our subjects learned this because he had an uncle who visited him and who stuttered, another because a father who once stuttered was always showing over-concern with his speech, several of the others because teachers and parents reacted in some very definite fashion when they went through the normal experience of not being able to control their speech when in highly emotional states. It may be that in several of these instances the teacher and parents were simply reacting to the general state of upset that the child was showing rather than the speech alone. However, in these cases the child felt that it was to his speech they were reacting as that was the most dramatic and apparent evidence of the emotional disturbance. Many other children, however, go through similar experiences and do not become stutterers. Any theory of stuttering, or any theory of the origin of the stuttering reaction, must also allow for other factors which will account for the continuance of these interruptions in some cases and not in others.

The manner in which "pampering" operated in the development of stuttering seemed also to be clearly indicated in all these cases. Pampering was defined in the earlier article already cited as including " . . . those types of behavior that are sometimes called babying, spoiling, over-protecting, etc. It can be described as that type of training which affects the child so that he becomes dependent on others to do things for him and to solve his problems, so that the child feels inadequate to solve his own problems successfully." It appears that the pampering has an indirect effect by giving rise to fears and feelings of inadequacy or inferiority which result in emotional breakdown, under certain conditions, and the consequent inability to control speech. Early pampering also has the effect of determining many needs, depending on the nature of the pampering. The child pampered at home meets situations outside of the home in which he is treated differently. These act as traumata and the feelings of inadequacy center about the very thing the child has always received the most of, but suddenly feels he is no longer receiving. So, for example, the only child may always feel that he does not have enough attention, the over-protected child always has a need for greater protection, the child who has learned to dominate his parents must dominate everyone in order to feel secure, etc. In the case of all these stutterers, some such need was served in the beginning and during the course of the stuttering. That is to say, after the stutter-

ing reaction became available to the child and took on some special meaning, such as, "this will excuse me from recitation," or "this will bring me a great deal of attention," or "this will make my mother concerned over me so that she has to protect me even more," or any other. the speech reaction persisted if it fitted in with the particular needs of that child at that time.

A fourth striking element in all these histories lies in the generality of the attitude towards stuttering. That is, these stutterers' attitudes towards stuttering were consistent with their whole unified personality. The subject who used stuttering as a rationalization for failure, had many other mechanisms by which he rationalized failure; in fact, this tendency stood out in all his activities as perhaps the most characteristic feature of his approach to any problem. The subject who developed stuttering following displacement by a young sister also developed many other mechanisms unconsciously designed to retain control of the parents. His attitude towards stuttering was characteristic of his attitude towards life as a whole. To use an expression of Adler's, we can say that the stuttering and the attitude towards it were always characteristic of the subject's whole "style of life."

UNDERSTANDING STUTTERING

Before outlining a theory of stuttering, it is necessary to define how the term stuttering is used in this paper. An examination of the experimental literature as well as clinical evidence points to the impossibility of defining stuttering simply in terms of speech alone. Many so-called normal speakers have more frequent and longer speech blocks or interruptions than some stutterers. Cases have even been reported of people coming to a speech clinic because they were afraid that they would "stutter," but who actually had quite fluent speech. In studying not only the individual but the phenomenon itself, the psychological factors must be considered as an intrinsic part of the syndrome.

Of the eight cases included in this study, seven could talk to themselves when absolutely alone without any speech interruptions, the eighth had occasional interruptions, however much less than usual. This finding has been duplicated in other clinics. This is only one of a whole wealth of facts that point to the inadequacy of either defining or understanding stuttering merely in terms of speech mechanisms. The definition to be given here is in part suggested by the work of Wendell Johnson. *Stuttering is defined as a rhythmic disorder in speech in a person who is aware of his speech as being different from that of other people and who reacts to it as if it were a handicap.* A stutterer then would be one who feels he has a handicap due to the disturbances in the rhythm of his speech. This would include cases where the actual speech difficulty was perhaps less than some normal speakers experience, but was reacted to by the person as if it were unlike that of other people. This may not appear essentially different from other definitions, but the inclusion of the expression "one who feels he has a handicap" provides a significant distinction.

It is also necessary to define the word "need," which has already been used frequently. As used here, "need" is a psychological concept

referring to specific conditions, and it should not be confused with the term as used by some other authors to connote a relatively undifferentiated physiological state. It is impossible, however, to describe the author's complete theoretical approach to psychology which would be necessary for a wholly adequate definition of this crucial term. It seems sufficient for present purposes to define a need as a *behavioral tendency to obtain a particular goal or complex of goals which the individual may or may not be aware of*. That is, a need is the behavioral coordinate of a goal.

This theory states that in order for a child to begin stuttering, two simultaneous conditions must exist. These can be called the availability of stuttering and the need for it. By availability is meant some meaningful contact with the phenomena of stuttering so that a definite attitude is taken towards interruptions in speech through the behavior of the people in the immediate environment. So, the child who has a relative or close friend who stutters, and who is treated in some characteristic fashion by the people around him, has stuttering available to him. The child who has never heard the word "stutterer," but is causing concern and comment from his parents or teachers because "he is speaking too rapidly" or "stumbling over his words," has stuttering available to him. The child who finds people reacting to his own emotional states with their consequent loss of speech control, has stuttering available to him. The child whose speech pattern is hesitant either through training or organic causes, and sooner or later finds that he may belong in a special class of people due to his speech, has stuttering available.

The need is not for stuttering as such, but for a mechanism which will serve some definite purpose. So, the need exists with the child who wishes to avoid the painful situation of reciting, for the child who wishes to gain attention, for the one who wishes to wrest back control of the parents from a sibling, for somone who finds it necessary to find an excuse for a particular failure, and then for all future imagined failures; it is present in the child who wants to convince his parents that he requires more protection than he is getting. This does not imply that this need cannot lead to many forms of behavior other than stuttering. It will lead to stuttering only when that particular mechanism is available, and even then the same need may lead to many other attempts at reaching the required goal. It might be argued that such needs are present with almost all children, but in order for them to result in some such behavior as stuttering, it must be so great that other goals such as direct achievement, and the admiration of other school children, are willingly sacrificed for this more important one.

In other words, the child who begins to stutter must first have the pattern available to him. For stuttering, to persist it, must serve some important purpose; one that is in keeping with the whole experiential history and with the whole organization of the personality. This purpose may change with time; it may remain and others be added; it may remain constant; or it is possible that the need may disappear in the adult and the stuttering remain. In the latter case the habitual speech pattern persists but this may change slowly to become less and less unusual or will be cleared up entirely by almost any kind of therapy. The

fact that almost any treatment, no matter how weird, will result in some permanent cures is accounted for here by the cases we consider as those where the need has disappeared. (Sometimes, however, it is also possible, under conditions of strong suggestion, for the subject to give up one mechanism and to substitute another.) In these cases the environment, so to speak, forces the individual into a situation where the defense is no longer necessary. Some good man or woman, for example, shows them that they need not defend themselves against the thesis that "no one loves me"; or, as in the case of the stutterer who received a job teaching because of the shortage of commercial teachers, they no longer need to defend themselves against the feeling that they can not cope with the world themselves, and, as he did, they may give up stuttering completely. The child (Case 1) who was taken out of school and put back into the pampered atmosphere of the home no longer needed the stuttering and he also gave it up. In most cases the actual purpose changes or at least takes on additional meanings. What may start as a method of gaining attention may become a means of protecting oneself against the feared failures in the realms of sexual and occupational achievement. That is, the stuttering in some cases becomes a way that the stutterer uses to convince himself that he could accomplish something were it not for the fact that he stutters and that, of course, is not his fault.

It is apparent that this theory did not arise solely out of an examination of these eight cases and the experiment that motivated this study, but from clinical experience with many cases of stutterers and nonstutterers and contact with the literature in the field of psychology and stuttering. It is impossible to discuss all or even a large part of the theoretical and research literature on stuttering in relation to this theory; however, it is necessary to examine certain main lines of evidence.

We might first present the theory again in outline form for the convenience of the reader. The theory states that in order for an individual to begin to stutter, two conditions must exist simultaneously. First, there is the *availability* of stuttering, which may come from (a) normal or average speech to which is given abnormal attention, (b) other stutterers in the environment, (c) speech that is abnormal in that hesitancy, blocking, or repetition is more frequent than usual, either through organic or training causes, and (d) frequent loss of control of the speech mechanism due to emotional states. All four of these include some meaningful reaction of another person or persons in the immediate environment. Secondly, there is a *need* for a defense or other purposeful mechanism. This need (a) may stay the same, (b) may change over the course of time, (c) may become associated with other additional purposes, (d) may change from situation to situation, and (e) may disappear.

There is nothing strikingly new about such a theory. Authors too numerous to mention have written about one or the other of these factors. If there is anything at all new about this theory it lies in its synthesis of two points of view and its systematization. It represents

a framework not simply for stuttering, but for all similar behavior disorders.

Many clinicians will object to such a theory because stutterers, even those psychologically trained who feel they have insight into their own behavior, react violently to the theory that they stutter because it is serving some purpose, or fulfilling some need. However, we only have to observe the behavior of any man, "even" though he has been psychoanalyzed, to see how many irrational things he does and how little he understands of the motivation of his own behavior, particularly where that behavior is concerned with ego-protection, to realize that this "introspective" objection cannot be considered as holding any scientific validity. In fact, the emotionality of the objections is perhaps suggestive evidence of the validity of the theory. It is frequently the case in all behavior that can be considered as a defense or compensatory mechanism, that the individual will attempt to protect his own rationalization and reacts quite violently to any theory that will, so to speak, expose the real nature of the mechanism.

Other extensive, published case histories seem to fall as easily into this framework as the eight given here. For example, Johnson's (4) autobiographical history and the cases published by Brown (2) contain all the necessary elements outlined above.

The evidence from the many physiological lines of work at first seems to oppose such a formulation. However, there are two important characteristics of these studies to be considered. The neuro-physiological disturbances are not consistent from stutterer to stutterer nor are they consistent within the individual. Just as a hand functions differently when it is lifting a ten-pound weight than when lifting a one-ounce weight, so does the neuro-physiological mechanism function differently when the individual is stuttering than when he is speaking normally. The mistake lies in believing that the physiological difference is the cause of a psychological act. It must be remembered that the hysterically blind actually can not see, and that a hysterically paralyzed limb is in a different physiological condition from one that is not paralyzed, but the physiological change is not the important factor in understanding the hysteria. The individual may learn to perform the motor acts which produce blocking or repetition just as well as he learns those which lead to "normal" speech and probably is just as much unaware of how he has learned to hesitate as he is unaware of how he has learned to speak fluently. It is obvious that an unlimited number of possible acts can cause speech interruptions and in studying stuttering we find just such an endless variety. It has been clinically demonstrated many times that one can easily change the way in which a particular case stutters. *The studies on physiological disfunctions give part of the description of how the individual stutters, but do not relate to why the individual stutters.*

Concerning the alleged number of stutterers whose handedness had been shifted, it should be pointed out that for every stutterer who has been shifted there are anywhere from ten to sixty people (estimates of the number of people born left-handed vary widely) who have been shifted and who do not stutter. It is clear, however, that the emotional

upset of such a shift might in some cases provide a basis for the frequent effective breakdowns of which we have spoken.

The evidence from studies on the importance of psychological factors in the moment of stuttering[1] emphasize the learned nature of the stuttering reaction and throw light on the question of why a stutterer stutters on certain words and phrases rather than others, but an understanding of the amount of stuttering in any larger behavior segment requires, as many other studies have shown, an understanding of the social situation as a whole and the emotional reactions of that particular subject to that situation.

A question almost sure to arise concerns children who begin to stutter from the beginning of speech or at early ages of two, three or four years.

The work of Steer (7), Johnson (5), and Davis (3) shows that the speech of these so-called early stutterers, at time of first diagnosis of stuttering, is not significantly different from that of children of the same age who do not stutter. What is different, to a large degree, is the attitudes of parents towards these children. The easy bouncy repetitions of children are normal and are not similar to the phenomena we are treating here as stuttering which involves psychological attitudes that are readily observable in the speech symptoms frequently called secondary reactions. Further, it seems that many stutterers, who state that they have stuttered since the beginning of speech or from a very early age, when questioned, report that they themselves have no memory for such stuttering but the parents looked back in retrospect and did remember that "Johnnie did seem to have trouble before." Any parent can look back at the speech of almost any child and come to the same conclusions.

The baffling question of why we have so many more male than female stutterers appears to have at least a theoretical solution along these lines. The earlier published article suggested that differences in training due to sex, differences which were minimized in the only child where the sex ratio was reduced, were an important factor in understanding the sex difference in frequency of stuttering. Along these lines, it might be more explicitly stated that perhaps male children are pampered more than female children, and that the value of various goals are stressed differently so that the goals that have to be given up in order to stutter are more important to girls than to boys due to general cultural differences in our training of the sexes.

It has been stated at times that the stutterer does not stutter because he is insecure, but is insecure because he stutters. Although in this paper we have tried to relate insecurity to the etiology of stuttering, we must admit that there is some circularity in this relationship. The individual who has already begun to stutter (in other terms, one who has already developed secondary reactions) finds, particularly as he approaches adulthood, that the stuttering brings considerable punishment. Under these circumstances he may stop stuttering, as many do, or becoming

[1]Many of the series of articles on the "Psychology of Stuttering," written or directed by Wendell Johnson, *J. Sp. Dis.*, 1938, 1939, and 1940, are excellent examples of such studies.

more insecure, he may lean even more heavily on his "handicap" as a defense mechanism.

This discussion of various lines of evidence in relation to this theory is not given as proof, but more as a suggestion for further research. The specific needs or modes of availability listed are not intended to be all-inclusive nor is the factor of pampering believed to be operative in every case. Neglected, hated, children with organic defects may develop a strong need for a defense such as stuttering presents. Many questions remain to be answered. Exactly what are the factors in training which produce these different systems of values between the sexes? How slight may the need be when the availability is very great? How weak may the availability be when the need is very great? The discussion may perhaps seem to slight the factors of availability, but this is not the intension. In fact, the abundant evidence of how stuttering appears to run in families is taken here not as an indication of the inheritance of stuttering, but as an indication of how important the psychological factor of availability is.

THERAPY

Such a theoretical framework for stuttering has very definite implications for a therapeutic approach. Once the person has stuttered, the availability is always present. Even if we can get him to eliminate all his blocks through speech exercises, suggestion, relaxation, or social isolation, the fact that he has once stuttered always makes that pattern available to him, and he will revert to it in a situation where the need is great enough. Any effective and lasting therapy, then, must concentrate on the need, although in some cases it may be necessary or at least a wise therapeutic measure to carry on some parallel work in the mechanics of speech.

If we accept the idea that the stutterer is using his stuttering as a defense of some kind and that he wishes, therefore, to protect the rationalization "that he can't help stuttering" (i.e. by relating it to some physiological or hereditary cause) and will react emotionally to any theory that will "expose" this mechanism, we can develop more specific suggestions as to the porcedure and nature of an efficient therapy. We also accept the assumption that, if a stutterer does not stutter in a situation where he is secure, to accomplish a speech therapy we need not use techniques concerned with the mechanics of speech, but change the situations or the attitudes towards the situations where he is insecure. What will be described here is the actual procedure used on the first five cases described earlier. The reasons for the selection of these five rather than the whole eight were mainly ones of convenience and limits on the author's time. Case 6 was not included as this subject was not added to the group until much later than the others; Case 7 because the stuttering at the time was very mild, almost entirely limited to oral reading situations; Case 8 as the author felt that this case represented too severe a personality maladjustment to be adequately treated in the two months' time available.

The first step in this therapy was the gathering of information. The methods have already been described. After several sessions of this, the

subject is forced without the therapist doing anything but asking questions to re-evaluate to some extent his own history and his rationalizations concerning stuttering. That is, he is forced simply by the weight of the evidence he himself has produced to realize the significance to his speech of his general adjustment and attitude towards life. The first specific technique suggested was for the stutterer to do one hour's reading aloud to himself every day. However, after a few days of this he was told that the only purpose of this was to emphasize and re-emphasize to him the fact that he did not have to stutter, and that if he was to understand his own stuttering he must look to psychological factors in terms of the situation that he is in. A second phase of the therapy was to go into the stutterers' own theories as to the nature of their stuttering or stuttering in general, discussing other therapies that they had been subject to and evaluating experimental evidence and discussing cases. Accepting again the fact that the stutterer will react negativistically to any theory that purports to demonstrate his stuttering as a defense device, the emphasis here was on other cases. The subjects found it quite easy to accept an interpretation of this kind for a particular case, other than their own, whose history they knew in some detail. However, no effort was made to interpret their own history in full. The cases talked about were ones with elements common to their own history and it was not long before all these subjects were saying and thinking that perhaps a similar interpretation would apply to them. Cases were also discussed who showed "personality disorders" other than stuttering. The general concepts of need, purpose, compensation, inferiority feeling, insecurity, etc., were discussed and explained. Reading assignments to literature in the field of personality theory and of stuttering were made and the material discussed.

The third phase of this therapy was that of interpretation. The subject's entire history and his day-to-day experiences were examined in terms of the theory already outlined.

At this time a group therapeutic situation was introduced. The five cases met once a week for two hours in addition to the three regular weekly individual interviews. Approximately the first half of that time was spent in a discussion of some abstract concept such as "style of life," "pampering," "preparation for a goal by building a defense in advance," "control through weakness," and others. The latter half of the session was taken over by one of the five who discussed his own speech history in relation to the preceding discussion. This appeared to be a very valuable part of the therapy. It served to objectify the stuttering of the subject who was giving his own history and to strengthen the acceptance of the interpretation along similar lines of the stutterers in the group. They asked each other questions and tried to outdo each other in the extent to which they were able to probe beneath the surface for purposes and psychological motivations. The entire time spent with these cases was about three months, including the taking of histories, which took up the first month.

In addition to the continuation of the interpretation phase and the group sessions, the last month was devoted mainly to building new, constructive attitudes. The old attitudes were described as a mistaken view

by which the adult was meeting present-day situations with the same reactions they gave to childhood situations. They were encouraged in their ability to speak normally and to face life situations in the three fields of human endeavor, sexual and marriage, occupational, and social, without the need of the defense mechanism which they used to avoid these situations. They were also directed to turn their attention away from themselves and on to the situation and the ideas they wished to express. Specific "difficult" situations were examined objectively and the subjects were usually able to face these situations armed with a new attitude with little or no stuttering. Programs for dating, establishing friends, changing from an egocentric to an extrocentric social point of view, and planning for an occupational adjustment, were instituted and carried out.

As the therapy progressed, general factors of adjustment concerning the individual's approach to the problems of life were emphasized more and more and the emphasis changed from that of a stuttering therapy to a personality therapy, whereby stuttering was used as an example of one of the individual's characteristic behavior reactions, a reaction which was related to and expressive of the personality as a whole.

In general, the results of this therapy give, at least, permissive evidence of the validity of the theory and the therapy outlined here. At the conclusion of the study, two of the cases (2, 3) did not stutter at all and had not stuttered after a period of one and a half years, when the last report on them was available. Both after the conclusion of the therapy and after a period of one and a half years, Cases 1 and 5 are described by themselves and by the head clinician as no longer regarding themselves as stutterers nor feeling the need for any work on their speech, although they occasionally still have slight interruptions. The fifth case has improved his attitude towards his speech considerably, although the same improvement was not fully paralleled in his speech. However, in this case a period of about three weeks more than in the other cases was necessary in order to have the subject give up all intellectual and emotional ties to a shift in handedness therapy which he had completely accepted just prior to the beginning of this therapy. Quite unfortunately the extra time that was necessary in this case was not available.

SUMMARY

A working hypothesis for the understanding and treatment of stuttering has been presented in outline. The theory represents a systematic framework, in terms of availability and need, in which stuttering as well as many other behavior disorders may be viewed and which rather than answering the experimental problems in the field perhaps opens even more problems. Clinical, experimental, and purely rational evidence to favor this hypothesis has been advanced and discussed. The theory is an individual one which presents a framework in which individual stutterers can be studied rather than one which attempts to give a single explanation for all stuttering. The therapy based on this psychological interpretation of stuttering also is elastic and suited to the individual taken as a whole and not simply to the single symptom we

call stuttering. It attempts, in most cases, to cure stuttering without relying on any techniques which are concerned purely with the mechanics of speech production.

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